Pioneer sound.vision.soul

Service Manual

ORDER NO.
CRT4088

CD RDS RECEIVER

DEH-P6000UB/X1PEW5

This service manual should be used together with the following manual(s) listed below. For the parts numbers, adjustments, etc. which are not shown in this manual, refer to the following manual(s).

Model No.	Order No.	Mech. Module	Remarks
DEH-P6000UB/XN/EW5	CRT4036		
CX-3240	CRT4050	S10.5COMP2-iPod/USB	CD Mech.Module : Circuit Descriptions, Mech. Descriptions, Dissassembly

EXPLODED VIEWS AND PARTS LIST

PACKING(Page 34)

PACKING SECTION PARTS LIST

Mark	No.	Description	DEH-P6000UB/XN/EW5	DEH-P6000UB/X1PEW5
	6	Unit Box	QHG3001	QHG3002
	7	Contain Box	QHL3001	QHL3002

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS (USA) INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936
ⓒ**PIONEER CORPORATION 2007**
K-ZZW. DEC. 2007 Printed in Japan

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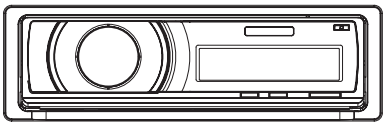
Service Manual



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For details, refer to "Important Check Points for Good Servicing".

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SAFETY INFORMATION

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfe.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

● Safety Precautions for those who Service this Unit.
When checking or adjusting the emitting power of the laser diode exercise caution in order to get safe, reliable results.

Caution:

1. During repair or tests, minimum distance of 13 cm from the focus lens must be kept.
2. During repair or tests, do not view laser beam for 10 seconds or longer.

CAUTION:
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

CAUTION
This product contains a laser diode of higher class than 1. To ensure continued safety, do not remove any covers or attempt to gain access to the inside of the product.
Refer all servicing to qualified personnel.

En

WARNING!

The AEL (accessible emission level)of the laser power output is less than CLASS 1 but the laser component is capable of emitting radiation exceeding the limit for CLASS 1.
A specially instructed person should do servicing operation of the apparatus.

Laser diode characteristics

Wave length : 785 nm to 814 nm

Maximum output : 1 190 W(Emitting period : unlimited)

Additional Laser Caution

Transistors Q101 in PCB drive the laser diodes.
When Q101 is shorted between their terminals, the laser diodes will radiate beam.
If the top cover is removed with no disc loaded while such short-circuit is continued, the naked eyes may be exposed to the laser beam.

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replaced only with the same or equivalent type recommended by the manufacture.
Discord used batteries according to the manufacture's instructions.

[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

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1. SERVICE PRECAUTIONS

1.1 SERVICE PRECAUTIONS

1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.
5. Be careful in handling ICs. Some ICs such as MOS type are so fragile that they can be damaged by electrostatic induction.

1.2 NOTES ON SOLDERING

- For environmental protection, lead-free solder is used on the printed circuit boards mounted in this unit.
  Be sure to use lead-free solder and a soldering iron that can meet specifications for use with lead-free solders for repairs accompanied by reworking of soldering.

- Compared with conventional eutectic solders, lead-free solders have higher melting points, by approximately 40 ˚C.
  Therefore, for lead-free soldering, the tip temperature of a soldering iron must be set to around 373 ˚C in general, although the temperature depends on the heat capacity of the PC board on which reworking is required and the weight of the tip of the soldering iron.

Compared with eutectic solders, lead-free solders have higher bond strengths but slower wetting times and higher melting temperatures (hard to melt/easy to harden).

The following lead-free solders are available as service parts:

- Parts numbers of lead-free solder:
  GYP1006 1.0 in dia.
  GYP1007 0.6 in dia.
  GYP1008 0.3 in dia.

2. SPECIFICATIONS

2.1 SPECIFICATIONS

General

Power source ..... 14.4 V DC (10.8 V to 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Backup current ..... 5 mA or less
Dimensions (W × H × D):
- DIN
  - Chassis ..... 178 mm × 50 mm × 162 mm
  - Nose ..... 188 mm × 58 mm × 14 mm
- D
  - Chassis ..... 178 mm × 50 mm × 162 mm
  - Nose ..... 170 mm × 46 mm × 14 mm

Weight ..... 1.5 kg

Audio

Maximum power output ..... 50 W × 4
50 W × 2/4 Ω + 70 W × 1/2 Ω (for subwoofer)
Continuous power output ... 22 W × 4 (50 Hz to 15 000 Hz, 5% THD, 4 Ω load, both channels driven)
Load impedance ..... 4 Ω to 8 Ω × 4
4 Ω to 8 Ω × 2 + 2 Ω × 1
Preout max output level ..... 2.2 V
Equalizer (3-Band Parametric Equalizer):
- Low
  - Frequency ..... 40/80/100/160 Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12 dB
- Mid
  - Frequency ..... 200/500/1k/2k Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12 dB
- High
  - Frequency ..... 3.15k/8k/10k/12.5k Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12 dB

HPF:
- Frequency ..... 50/63/80/100/125 Hz
- Slope ..... –12 dB/oct

Subwoofer (mono):
- Frequency ..... 50/63/80/100/125 Hz
- Slope ..... –18 dB/oct
- Gain ..... +6 dB to –24 dB
- Phase ..... Normal/Reverse

Bass boost:
- Gain ..... +12 dB to 0 dB

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal-to-noise ratio ..... 94 dB (1 kHz) (IEC-A network)
Number of channels ..... 2 (stereo)
MP3 decoding format ..... MPEG-1 & 2 Audio Layer 3
WMA decoding format ..... Ver. 7, 7.1, 8, 9, 10, 11 (2ch audio)
(Windows Media Player)
AAC decoding format ..... MPEG-4 AAC (iTunes® encoded only) (.m4a)
(Ver. 7.2 and earlier)
WAV signal format ..... Linear PCM & MS ADPCM (Non-compressed)

USB

Specification ..... USB 2.0 full speed
Supply current ..... 500 mA
Maximum amount of memory ..... 250 GB
File system FAT16, FAT32
MP3 decoding format ..... MPEG-1, 2 & 2.5 Audio Layer 3
WMA decoding format ..... Ver. 7, 7.1, 8, 9, 10, 11 (2ch audio)
(Windows Media Player)
AAC decoding format ..... MPEG-4 AAC (iTunes® encoded only) (.m4a)
(Ver. 7.2 and earlier)
WAV signal format ..... Linear PCM & MS ADPCM (Non-compressed)

FM tuner

Frequency range ..... 87.5 MHz to 108.0 MHz
Usable sensitivity ..... 8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
Signal-to-noise ratio ..... 75 dB (IEC-A network)

MW tuner

Frequency range ..... 531 kHz to 1 602 kHz (9 kHz)
Usable sensitivity ..... 18 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

LW tuner

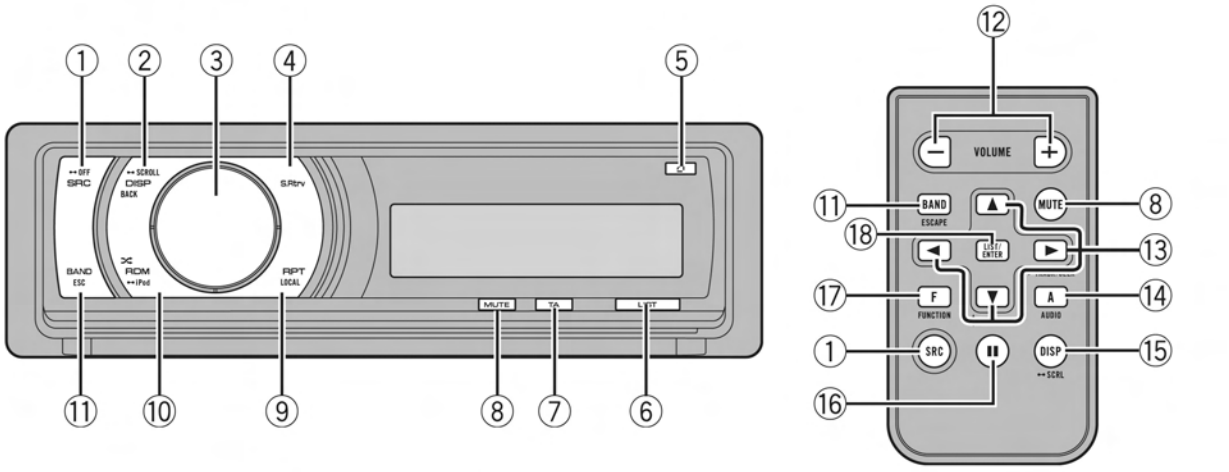
Frequency range ..... 153 kHz to 281 kHz
Usable sensitivity ..... 30 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

Note

Specifications and the design are subject to modifications without notice due to improvements. ■

2.2 DISC/CONTENT FORMAT

2.3 PANEL FACILITIES



What's What

Head unit

① **SRC/OFF button**
This unit is turned on by selecting a source.
Press to cycle through all the available sources.

② **DISP/BACK/SCROLL button**
Press to select different displays.
Press and hold to scroll the text information.
Press to return to the previous display when operating the menu.
Press and hold to return to the main menu when operating the menu.

③ **MULTI-CONTROL**
Move to perform manual seek tuning, fast forward, reverse and track search controls.
Also used for controlling functions.
Turn to increase or decrease the volume.

④ **S.Rtrv button**
Press to turn Sound Retriever function on or off.

⑤ **OPEN button**
Press to open the front panel.

⑥ **LIST button**
Press to display the disc title list, track title list, folder list, file list or preset channel list depending on the source.

⑦ **TA/NEWS button**
Press to turn TA function on or off. Press and hold to turn NEWS function on or off.

⑧ **MUTE button**
Press to turn off the sound. To turn on the sound, press again.

⑨ **RPT/LOCAL button**
Press to switch the repeat play range while using CD, USB or iPod.
Press to turn local function on or off while using tuner as the source.

⑩ **RDM/iPod button**
Press to turn random function on or off while using CD or USB.
While using iPod, press this button to shuffle all tracks.
Press and hold to switch the control mode while using an iPod connected USB connector of this unit.
If using the iPod with an interface adapter (CD-IB100Ⅱ), press to switch the shuffle function.

⑪ **BAND/ESC button**
Press to select among three FM bands and MW/LW bands.
Press to return to the ordinary display when operating menu.

Remote control

Operation is the same as when using the buttons on the head unit.

⑫ **VOLUME buttons**
Press to increase or decrease the volume.

⑬ **▲/▼/◄/► buttons**
Press to perform manual seek tuning, fast forward, reverse and track search controls.
Also used for controlling functions.

⑭ **AUDIO button**
Press to select an audio function.

⑮ **DISP button**
Press to select different displays.
Press and hold to scroll the text information.

⑯ **II (pause) button**
Press to turn pause on or off.

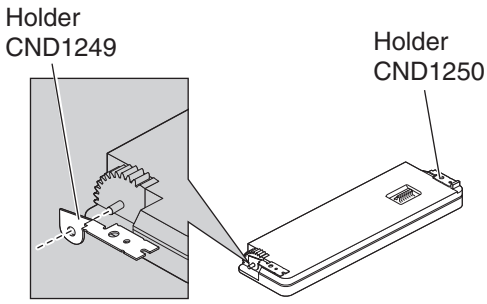
⑰ **FUNCTION button**
Press to select functions.

⑱ **LIST/ENTER button**
Press to display the disc title list, track title list, folder list, file list or preset channel list depending on the source.
While in the operating menu, press to control functions.

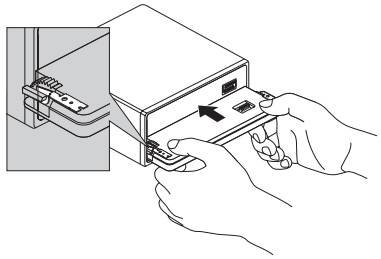
Fixing the front panel

If you do not operate the removing and attaching the front panel function, use the supplied fixing screws and holders to fix the front panel to this unit.

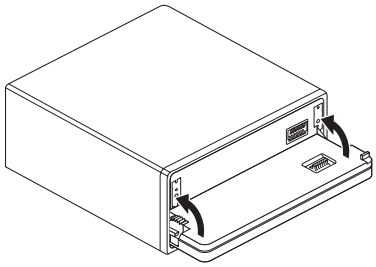
1. Attach the holders to both sides of the front panel.



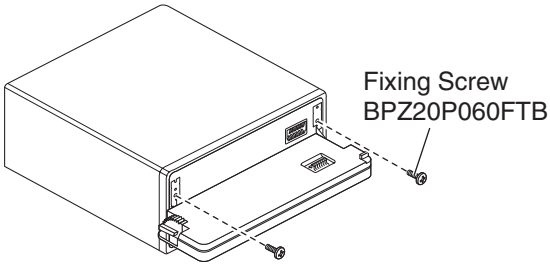
2. Replace the front panel to the unit.



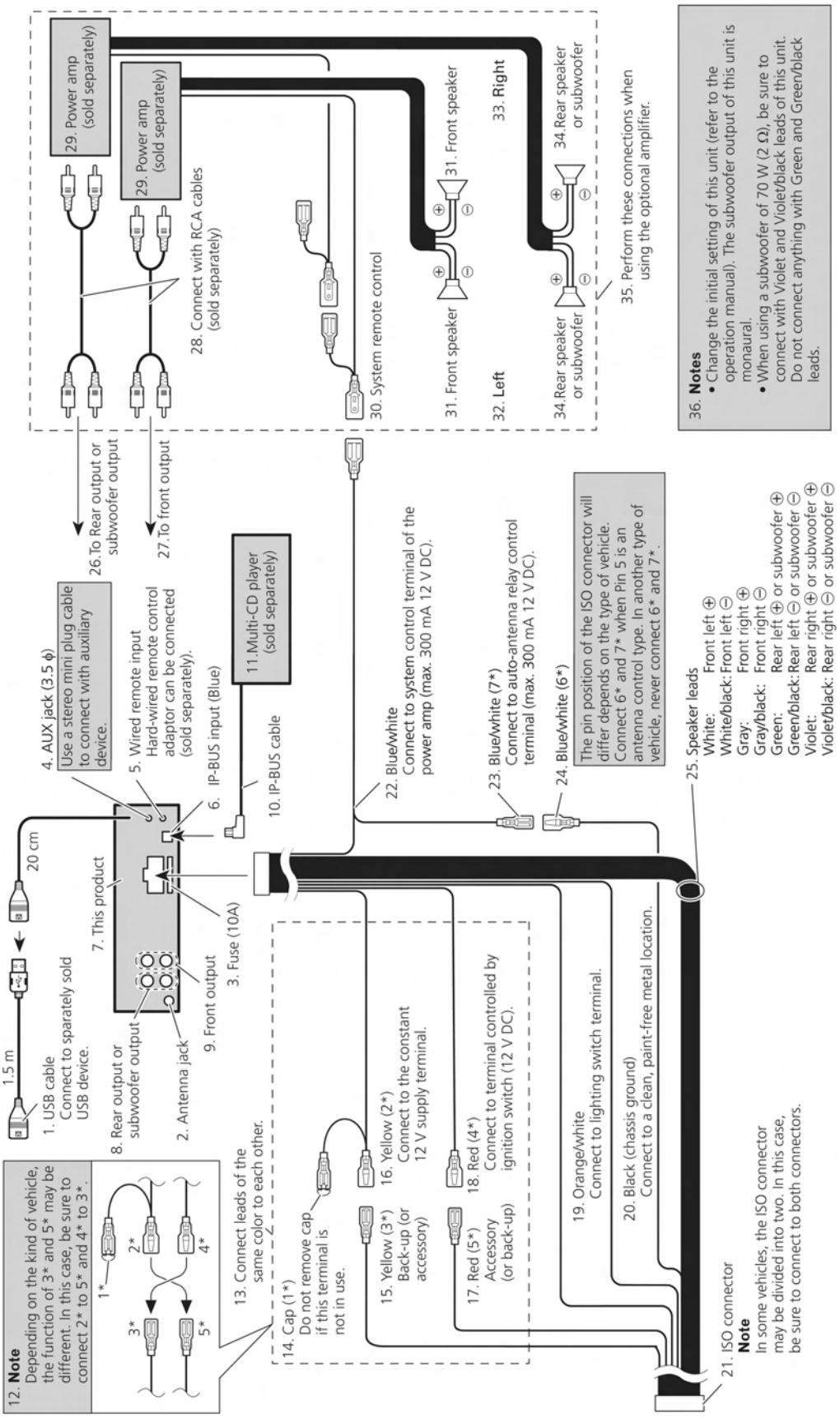
3. Flip the holders into upright positions.



4. Fix the front panel to the unit using fixing screws.



2.4 CONNECTION DIAGRAM


1. USB cable
Connect to sparately sold USB device.
1.5 m
20 cm
2. Antenna jack
3. Fuse (10A)
4. AUX jack (3.5 φ)
Use a stereo mini plug cable to connect with auxiliary device.
5. Wired remote input
Hard-wired remote control adaptor can be connected (sold separately).
6. IP-BUS input (Blue)
7. This product
8. Rear output or subwoofer output
9. Front output
10. IP-BUS cable
11. Multi-CD player (sold separately)
12. Note
Depending on the kind of vehicle, the function of 3* and 5* may be different. In this case, be sure to connect 2* to 5* and 4* to 3*.
1*
2*
3*
4*
5*
13. Connect leads of the same color to each other.
14. Cap (1*)
Do not remove cap if this terminal is not in use.
15. Yellow (3*)
Back-up (or accessory)
16. Yellow (2*)
Connect to the constant 12 V supply terminal.
17. Red (5*)
Accessory (or back-up)
18. Red (4*)
Connect to terminal controlled by ignition switch (12 V DC).
19. Orange/white
Connect to lighting switch terminal.
20. Black (chassis ground)
Connect to a clean, paint-free metal location.
21. ISO connector
Note
In some vehicles, the ISO connector may be divided into two. In this case, be sure to connect to both connectors.
22. Blue/white
Connect to system control terminal of the power amp (max. 300 mA 12 V DC).
23. Blue/white (7*)
Connect to auto-antenna relay control terminal (max. 300 mA 12 V DC).
24. Blue/white (6*)
The pin position of the ISO connector will differ depends on the type of vehicle. Connect 6* and 7* when Pin 5 is an antenna control type. In another type of vehicle, never connect 6* and 7*.
25. Speaker leads
White: Front left ⊕
White/black: Front left ⊖
Gray: Front right ⊕
Gray/black: Front right ⊖
Green: Rear left ⊕ or subwoofer ⊕
Green/black: Rear left ⊖ or subwoofer ⊖
Violet: Rear right ⊕ or subwoofer ⊕
Violet/black: Rear right ⊖ or subwoofer ⊖
26. To Rear output or subwoofer output
27. To front output
28. Connect with RCA cables (sold separately)
29. Power amp (sold separately)
29. Power amp (sold separately)
30. System remote control
31. Front speaker
31. Front speaker
32. Left
33. Right
34. Rear speaker or subwoofer
34. Rear speaker or subwoofer
35. Perform these connections when using the optional amplifier.
36. Notes
• Change the initial setting of this unit (refer to the operation manual). The subwoofer output of this unit is monaural.
• When using a subwoofer of 70 W (2 Ω), be sure to connect with Violet and Violet/black leads of this unit. Do not connect anything with Green and Green/black leads.

3. BASIC ITEMS FOR SERVICE

3.1 CHECK POINTS AFTER SERVICING

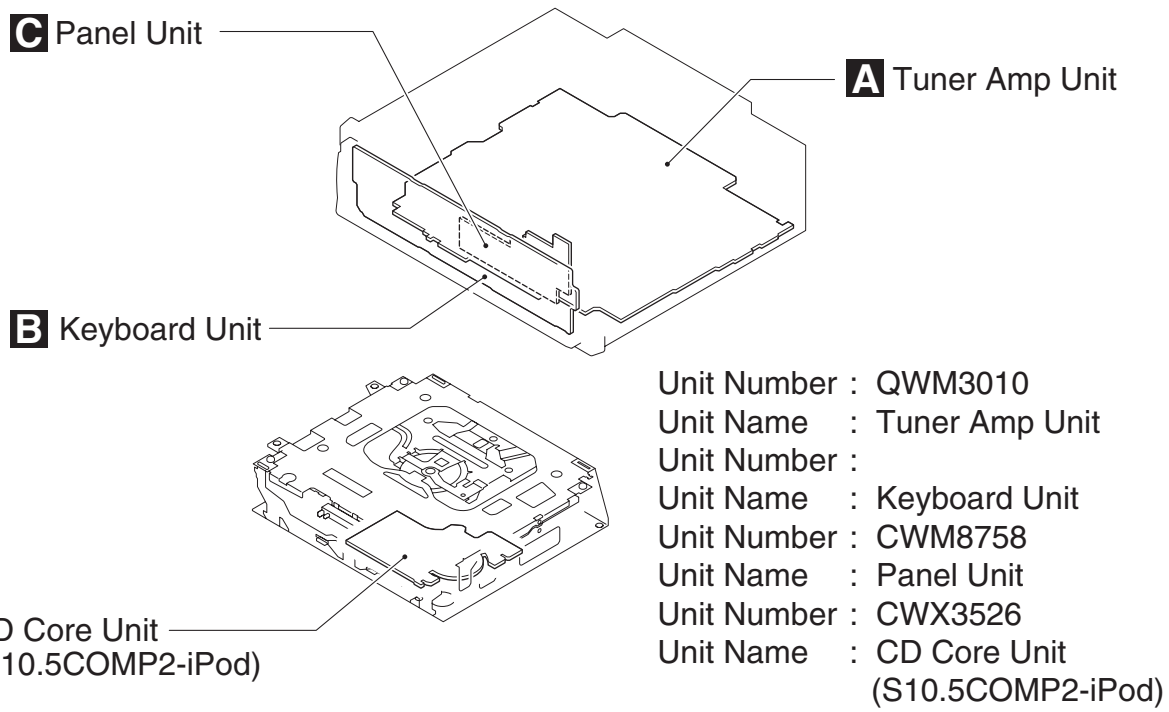
To keep the product quality after servicing, please confirm following check points.

No.		Procedures	Item to be confirmed
1		Confirm whether the customer complain has been solved. If the customer complain occurs with the specific media, use it for the operation check.	The customer complain must not be reappeared. Display, audio and operations must be normal.
2	CD	Play back a CD. (Track search)	No malfunction on display, audio and operation.
3	FM/AM tuner	Check FM/AM tuner action. (Seek, Preset) Switch band to check both FM and AM.	Display, audio and operations must be normal.
4		Check whether no disc is inside the product.	The media used for the operating check must be ejected.
5		Appearance check	No scratches or dirt on its appearance after receiving it for service.

See the table below for the items to be checked regarding audio:

Item to be checked regarding audio
Distortion
Noise
Volume too low
Volume too high
Volume fluctuating
Sound interrupted

3.2 PCB LOCATION



3.3 JIGS LIST

● Jigs List

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

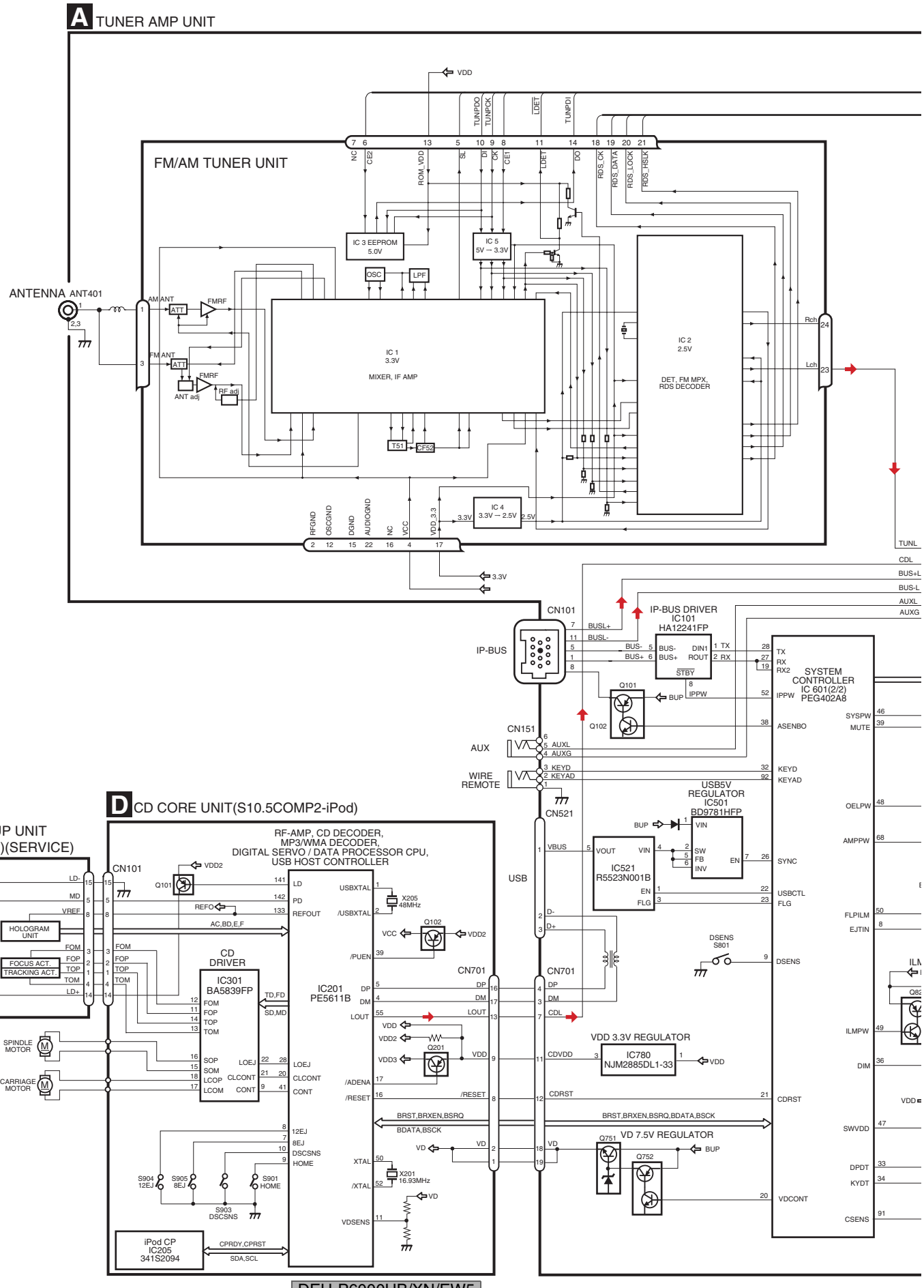
● Grease List

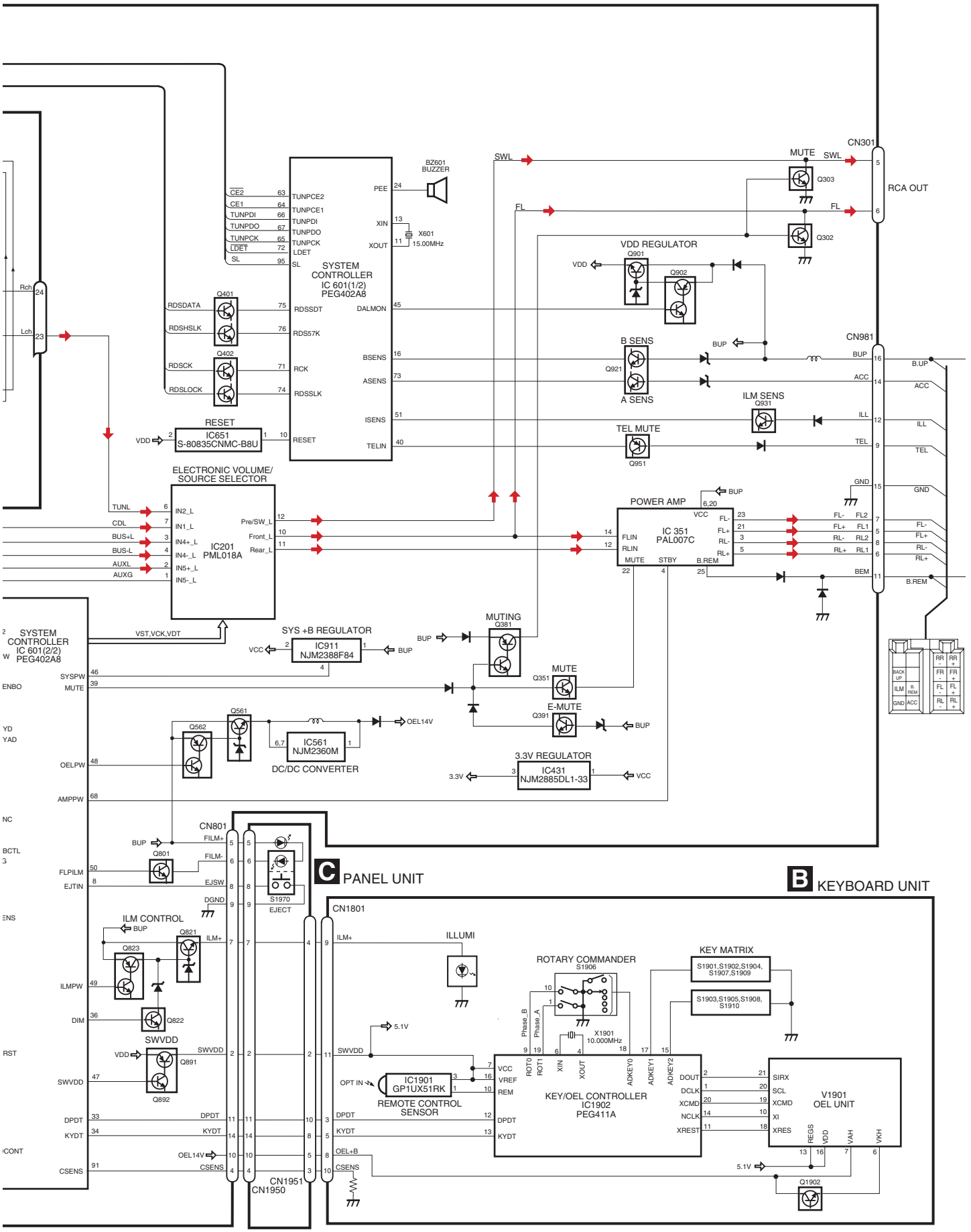
Name	Grease No.	Remarks
Grease	GEM1024	CD Mechanism Module
Grease	GEM1045	CD Mechanism Module

Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

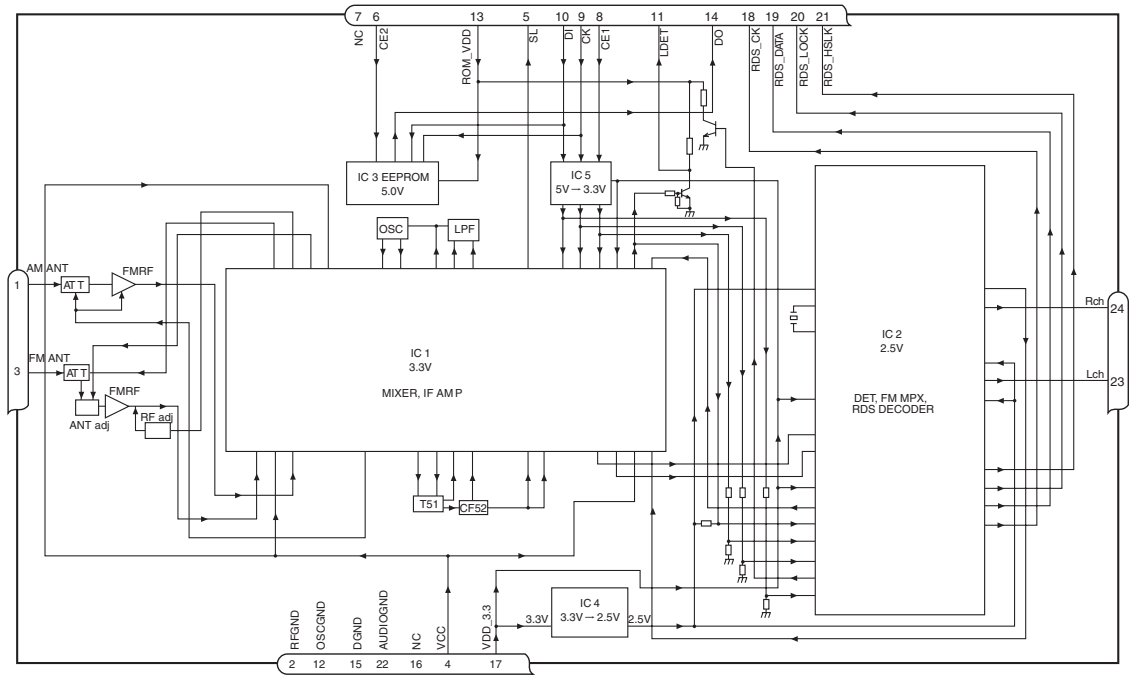
Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

4. BLOCK DIAGRAM




SYSTEM CONTROLLER IC 601(1/2) PEG402A8
BZ601 BUZZER
X601 15.00MHz
RESET
IC651 S-80835CNMC-B8U
ELECTRONIC VOLUME/ SOURCE SELECTOR
IC201 PML018A
SYS +B REGULATOR
IC911 NJM2388F84
MUTING
Q381
MUTE
Q351
E-MUTE
Q391
DC/DC CONVERTER
IC561 NJM2360M
3.3V REGULATOR
IC431 NJM2885DL1-33
VDD REGULATOR
POWER AMP
IC 351 PAL007C
RCA OUT
CN301
CN981
B SENS
A SENS
ILM SENS
TEL MUTE
SYSTEM CONTROLLER IC 601(2/2) PEG402A8
C PANEL UNIT
CN801
S1970 EJECT
ILM CONTROL
SWVDD
CN1951
CN1950
B KEYBOARD UNIT
CN1801
ILLUMI
ROTARY COMMANDER S1906
KEY MATRIX
S1901,S1902,S1904, S1907,S1909
S1903,S1905,S1908, S1910
X1901 10.000MHz
IC1901 GP1UX51RK
REMOTE CONTROL SENSOR
KEY/OEL CONTROLLER IC1902 PEG411A
V1901 OEL UNIT
Q1902

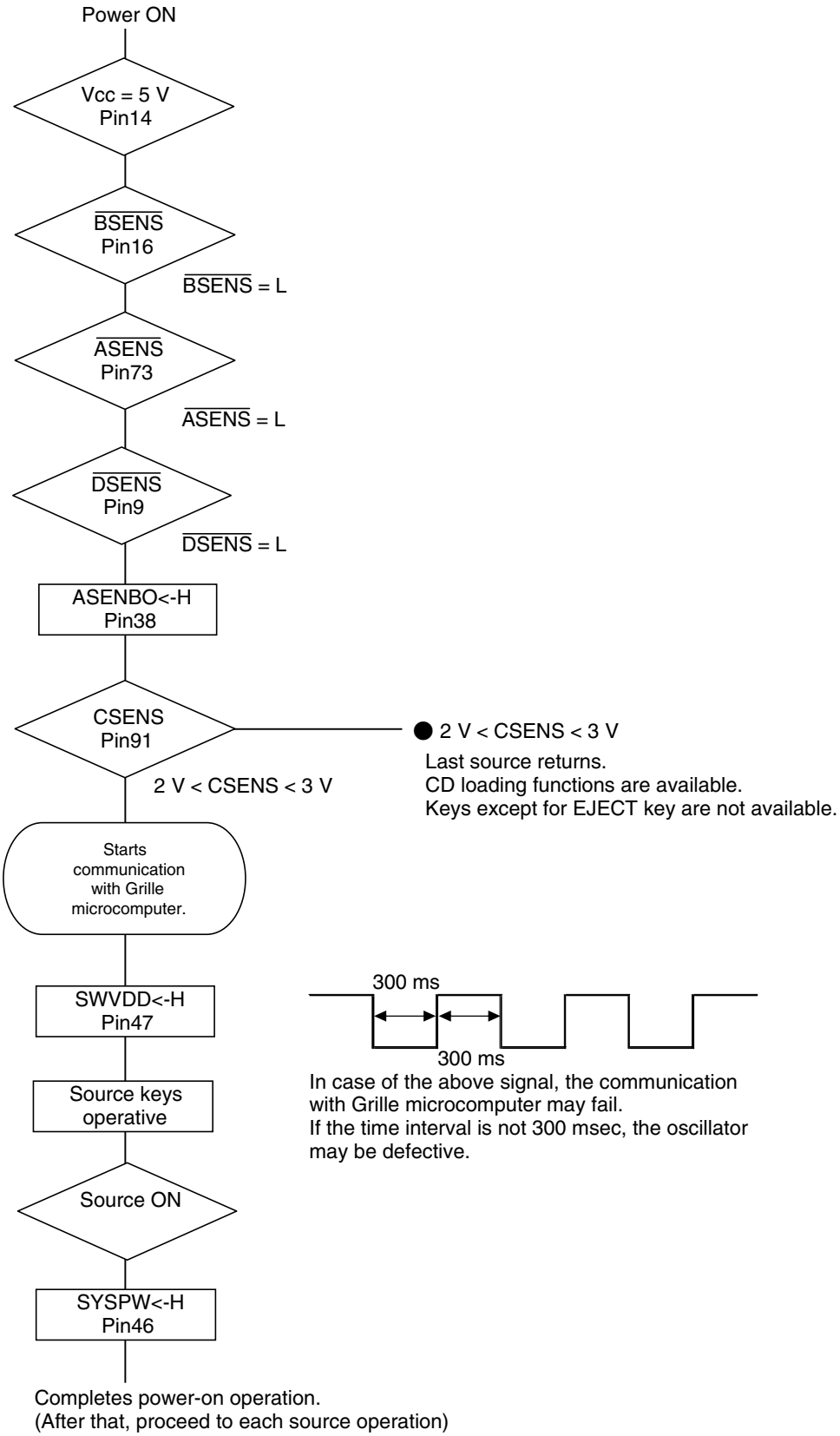
● FM/AM Tuner Unit



No.	Symbol	I/O	Explain	
1	AMANT	I	AM antenna input	AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7 µH. (LAU type inductor) A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the hum of power transmission line.
2	RFGND		RF ground	Ground of antenna block
3	FMANT	I	FM antenna input	Input of FM antenna 75 Surge absorber(DSP-201M-S00B)is necessary.
4	VCC		power supply	The power supply for analog block. D.C 8.4 V ± 0.3 V
5	SL	O	signal level	Output of FM/AM signals level
6	CE2	I	chip enable-2	Chip enable for EEPROM "Low" active
7	NC		non connection	Not used
8	CE1	I	chip enable-1	Chip enable for AF•RF "High" active
9	CK	I	clock	Clock
10	DI	I	data in	Data input
11	LDET	O	lock detector	"Low" active
12	OSCGND		osc ground	Ground of oscillator block
13	ROM_VDD		power supply	Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out	Data output
15	DGND		digital ground	Ground of digital block
16	NC		non connection	Not used
17	VDD_3.3		power supply	The power supply for digital block. 3.3 V ± 0.2 V
18	RDS_CK	O	RDS clock	Output of RDS clock(2.5 V)
19	RDS_DATA	O	RDS data	Output of RDS data(2.5 V)
20	RDS_LOCK	O	RDS lock	Output unit "High" active(2.5 V) (RDS_LOCK turns over by the external transistor . "Low" active)
21	RDS_HSLK	O	RDS high speed lock	Output unit "High" active(2.5 V)(RDS_HSLK turns over by the external transistor. "Low" active)
22	AUDIOGND		audio ground	Ground of audio block
23	L ch	O	L channel output	FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output	FM stereo "R-ch" signal output or AM audio output

5. DIAGNOSIS

5.1 OPERATIONAL FLOWCHART



5.2 ERROR CODE LIST

● CD Error Messages

If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

8-digit display	6-digit display	4-digit display
ERROR-xx	ERR-xx	E-xx

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG SERVO LSI Com- munication Error	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. → Failure on home switch or CRG move mechanism. Communication error between microcomputer and SERVO LSI.
11	Electricity	Focus Servo NG	Focusing not available. → Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. CD signal error.
17	Electricity	Setup NG	AGC protection doesn't work. Focus can be easily lost. → Damages or stains on disc, or excessive vibrations on REWRITABLE.
30	Electricity	Search Time Out	Failed to reach target address. → CRG tracking error or damages on disc.
44	Electricity	ALL Skip	Skip setting for all track. (CD-R/RW)
50	Mechanism	CD On Mech Error	Mechanical error during CD ON. → Defective loading motor, mechanical lock and mechanical sensor.
A0	System	Power Supply NG	Power (VD) is ground faulted. → Failure on SW transistor or power supply (failure on connector).

Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

Unreadable TOC does not constitute an error. An intended operation continues in this case.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

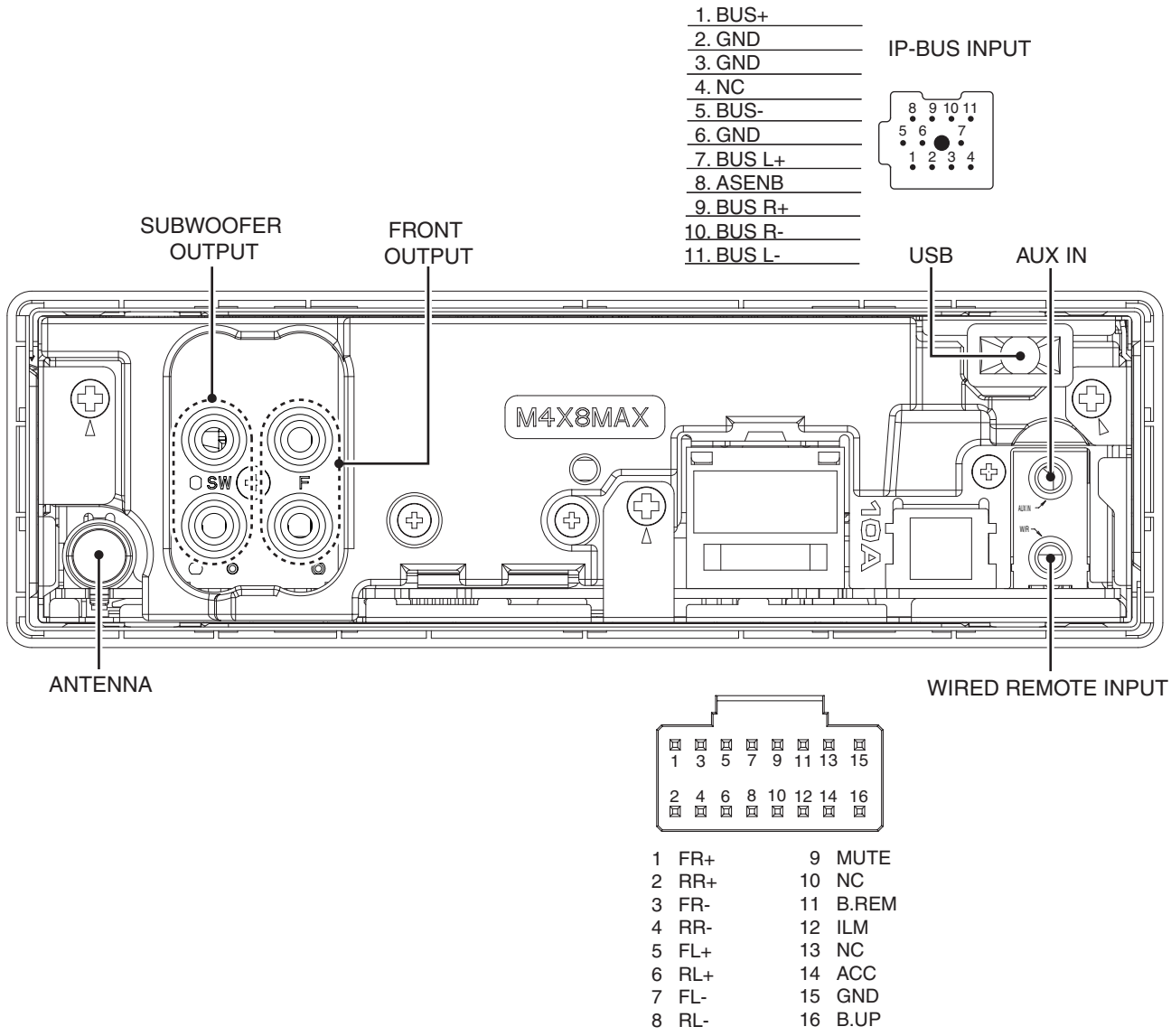
iPod error

Message	Cause	Action
NO SONGS	No songs in the iPod	Transfer the songs to the iPod.
STOP	No songs in the current list	Select a list that contains the songs.
ERROR-11	Communication failure	Disconnect the cable from the iPod. Once the iPod main menu is displayed, connect the cable again.
		Reset the iPod.
ERROR-21	Old version of the iPod	Update the iPod version.
ERROR-30	iPod failure	Reset the iPod.
ERROR-A0	iPod is not charged but operates correctly.	Check if the connection cable for the iPod shorted out. After checking, switch the ignition key or disconnect the iPod and connect again.

USB error

Message	Cause	Action
NO AUDIO	No songs in the USB device	Transfer the songs to the USB device.
	USB memory with security enabled is connected	Follow the USB memory instructions to disable the security.
TRK SKIPPED	The connected USB device contains WMA files that are protected by DRM	Play an audio file not protected by DRM.
PROTECT	All the files in the USB device are protected by DRM	Transfer the songs not protected by DRM to the USB device.
N/A USB	The connected USB device is not supported by this unit	Connect a USB device that is compliant as a Mass Storage Class.
CHK USB	The USB connector or the USB cable is short-circuited	Confirm the USB connector or the USB cable.
	The connected USB device consumes more than 500 mA (max. allowable current)	Confirm the USB device.
N/A PLAYLIST	Selected m3u playlist cannot be played back	Select another playlist.
	All the files on the selected m3u playlist are protected by DRM	

5.3 CONNECTOR FUNCTION DESCRIPTION



1	FR+	9	MUTE
2	RR+	10	NC
3	FR-	11	B.REM
4	RR-	12	ILM
5	FL+	13	NC
6	RL+	14	ACC
7	FL-	15	GND
8	RL-	16	B.UP

6. SERVICE MODE
6.1 CD TEST MODE

During pressing the "SOURCE" and "RPT" keys simultaneously, perform the reset-start, then turn ON the CD to enter the CDS test mode.

- **How to issue the 1 - 6 keys in the 08 model's slave test:**

The specification of the 08 model does not include the 1 - 6 keys issuance function for H/U and the remote control unit. Therefore, in order to issue commands in a slave test, use the direct FUNCTION keys alternatively to enable the equal key command sending function to the existing models.

Outline) Use the direct FUNCTION keys to display, select, or issue the KEY 1 - 6.

<Direct FUNCTION keys and corresponding functions>

Direct FUNCTION key	Normal mode	Slave test mode
A	S.Rtrv	**Selecting a key command**
B	RDM	**Issuing a key command**
C	RPT	**Switching a screen**

- For convenience, a name of each direct FUNCTION key is shown as "A", "B", and "C".

- **How to issue the 1 - 6 keys for the CDS source:**
  (The ▭ areas below are overwritten and displayed on character strings for the normal mode display.)

① During the slave test mode, the key name "K1" is shown at the left by default.
In this condition, press the A key to toggle K1 - K6, and select a command to be sent to the slave.

C	O	M	P	A	C	T		D	I	S	C				
K	1		!		T	-	!	!				!	!	!	!

FOLDER TRK MINUTE SECOND

- The one-line model shows only the bottom column.

A key

C	O	M	P	A	C	T		D	I	S	C				
K	6		!		T	-	!	!				!	!	!	!

② During the K1 - K6 key names are displayed, press the B key and issue the selected command.

C	O	M	P	A	C	T		D	I	S	C				
K	1		!		T	-	!	!				!	!	!	!

B key

Send a key command selected by pressing the KEY 1.

③ Press the C key to change display/non-display of key names.
When the non-display mode is selected for the K1 - K6 key names, "A key" and "B key" are invalid.

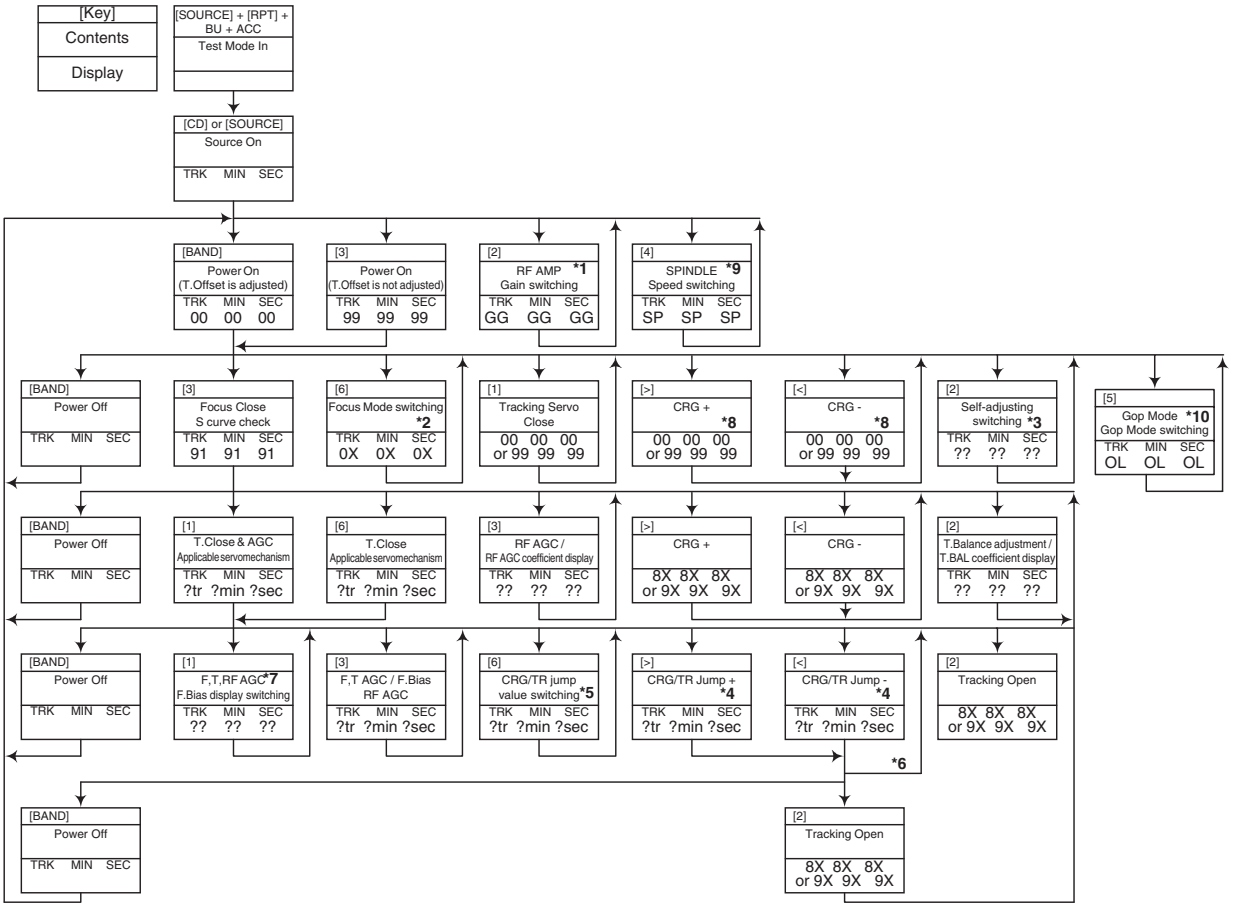
C	O	M	P	A	C	T		D	I	S	C				
K	1		!		T	-	!	!				!	!	!	!

C key

C	O	M	P	A	C	T		D	I	S	C				
F	-	!	!		T	-	!	!				!	!	!	!

- Pressing the A key or B key does not work.

Flow Chart


[Key]
Contents
Display
[SOURCE] + [RPT] + BU + ACC
Test Mode In
[CD] or [SOURCE]
Source On
TRK MIN SEC
[BAND] Power On (T.Offset is adjusted) 00 00 00
[3] Power On (T.Offset is not adjusted) 99 99 99
[2] RF AMP *1 Gain switching GG GG GG
[4] SPINDLE *9 Speed switching SP SP SP
[BAND] Power Off
[3] Focus Close S curve check 91 91 91
[6] Focus Mode switching *2 0X 0X 0X
[1] Tracking Servo Close 00 00 00 or 99 99 99
[>] CRG + *8 00 00 00 or 99 99 99
[<] CRG - *8 00 00 00 or 99 99 99
[2] Self-adjusting switching *3 ?? ?? ??
[5] Gop Mode *10 Gop Mode switching OL OL OL
[1] T.Close & AGC Applicable servomechanism ?tr ?min ?sec
[6] T.Close Applicable servomechanism ?tr ?min ?sec
[3] RF AGC / RF AGC coefficient display ?? ?? ??
[>] CRG + 8X 8X 8X or 9X 9X 9X
[<] CRG - 8X 8X 8X or 9X 9X 9X
[2] T.Balance adjustment / T.BAL coefficient display ?? ?? ??
[1] F,T,RF AGC *7 F.Bias display switching ?? ?? ??
[3] F,T AGC / F.Bias RF AGC ?tr ?min ?sec
[6] CRG/TR jump value switching *5 ?tr ?min ?sec
[>] CRG/TR Jump + *4 ?tr ?min ?sec
[<] CRG/TR Jump - *4 ?tr ?min ?sec
[2] Tracking Open 8X 8X 8X or 9X 9X 9X
*6
[BAND] Power Off
[2] Tracking Open 8X 8X 8X or 9X 9X 9X

*1) TYP (TRK MIN SEC) → + 6 dB ($^{TRK}06^{MIN}06^{SEC}06$) → + 12 dB ($^{TRK}12^{MIN}12^{SEC}12$)

*2) Focus Close ($^{TRK}00^{MIN}00^{SEC}00$ ($^{TRK}99^{MIN}99^{SEC}99$)) → S.Curve ($^{TRK}01^{MIN}01^{SEC}01$) → F EQ measurement setting ($^{TRK}02^{MIN}02^{SEC}02$)

*3) F.Offset Display → RF.Offset → T.Offset Display → Switch to the order of the original display

*4) 1TR/4TR/10TR/32TR/100TR

*5) Single → 4TR → 10TR → 32TR → 100TR → CRG Move
9x(8x):91(81) 92(82) 93(83) 94(84) 95(85) 96(86)

*6) Only at the time of CRG move, 100TR jump

*7) TRK/MIN/SEC → F.AGC → T.AGC Gain → F Bias → RF AGC

*8) CRG motor voltage = 2 [V]

*9) TYP (1X) (TRK MIN SEC) → 2X ($^{TRK}22^{MIN}22^{SEC}22$) → 1X ($^{TRK}11^{MIN}11^{SEC}11$)

*10) OFF(TYP) (TRK MIN SEC) → FORCUS ($^{TRK}70^{MIN}70^{SEC}70$) → TRACKING ($^{TRK}71^{MIN}71^{SEC}71$)

[Key]	Operation Test Mode
[BAND]	Power On/Off
[>]	CRG + / TR Jump + (Direction of the external surface)
[<]	CRG - / TR Jump - (Direction of the internal surface)
[1]	T. CLS & AGC & Applicable servomechanism / AGC,AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T. Open
[3]	F. Close,S Curve / Rough Servo and RF AGC / F,T,RF AGC
[4]	SPDL 1X/2X switching As for the double speed(2x), audio output cannot be supported.
[5]	Error Rate measurement ON : ERR 30Counts Start BER display data[%]
[6]	F. Mode switching / Tracking Close / CRG•TR Jump Switching

- As for the double speed (2x), audio output cannot be supported
- After the [Eject] key is pressed keys other than the [Eject] key should not be pressed, until disc ejection is complete.
- When the key [2] or [3] is pressed during the Focus Search, the power supply should be immediately turned off (otherwise the lens sticks to Wall, causing the actuator to be damaged).
- In the case of TR jump other than to 100TR, the function shall continue to be processed even if the TR jump key is released. As for the CRG Move and 100TR Jump, the mechanism shall be set to the Tracking Close mode when the key is released.
- When the power is turned on/off the jump mode is reset to the Single TR (91) while the gain of the RFAMP is reset to 0 dB. At the same time all the self-adjusting values shall return to the default setting.

7. DISASSEMBLY

***NOTE) While the photograph shown is slightly different from this model in shape, the disassembly procedure is the same.**

● Removing the Keyboard Unit (Fig.1,2,3)

Pull arrow direction
and remove Detach Grille Assy.(Fig.1)

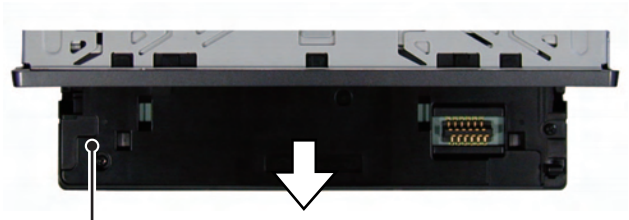


Fig.1

Remove the Knob Unit.(Fig.2)

Fig.2

1 Remove the four screws.(Fig.3)

Remove the Cover
and then remove the Keyboard Unit.

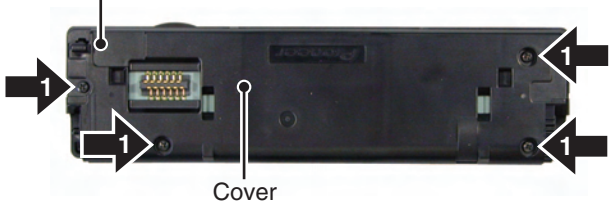


Fig.3

● Removing the Holder (Fig.4)

Take off the pick of left and right
and then a holder slide to the arrow course.

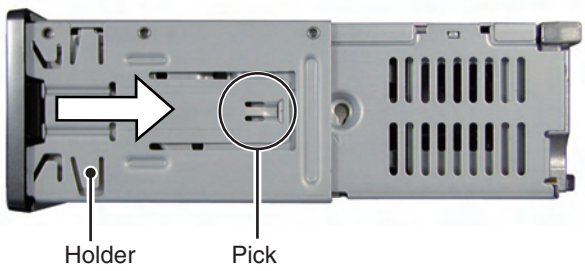


Fig.4

● Removing the Case and Panel (Fig.5)

Remove the Case and Panel.

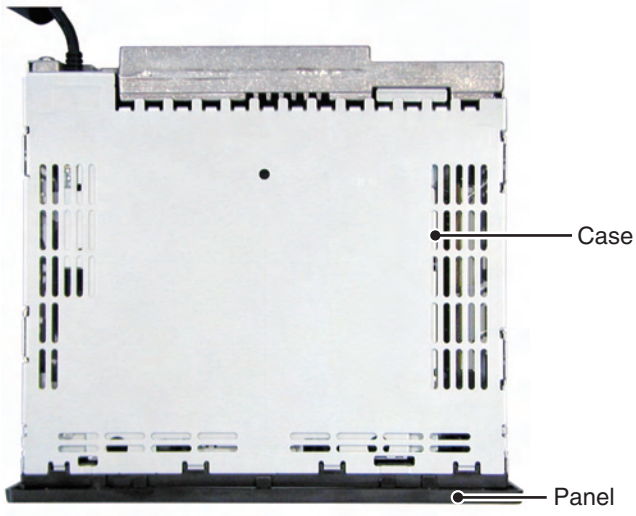


Fig.5

● Removing the CD Mechanism Module (Fig.6)

1 Remove the four screws.

Disconnect the cable
and then remove the CD Mechanism Module.

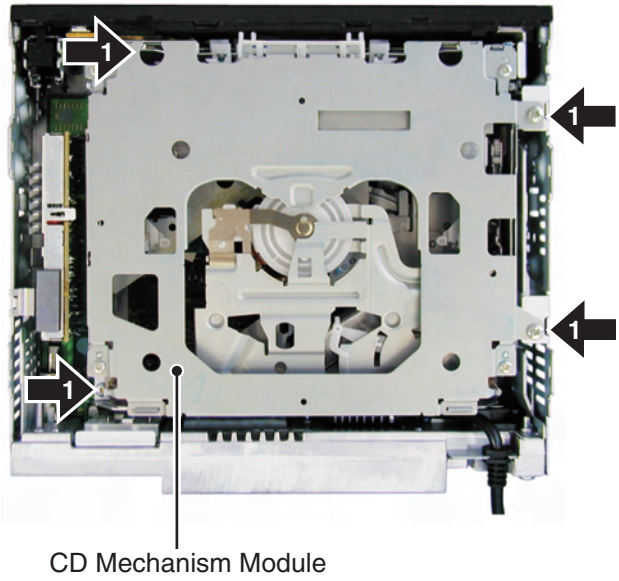


Fig.6

● Removing the Panel AssyFig.7,8)

1 Remove the two screws.(Fig.7)

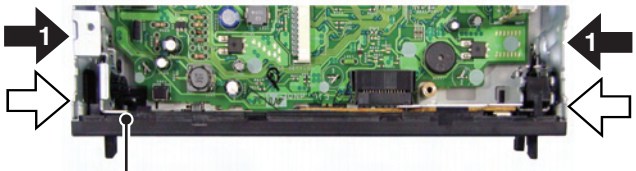


Fig.7

Push the place of the arrows
and then remove Panel Assy.(Fig.7,8)

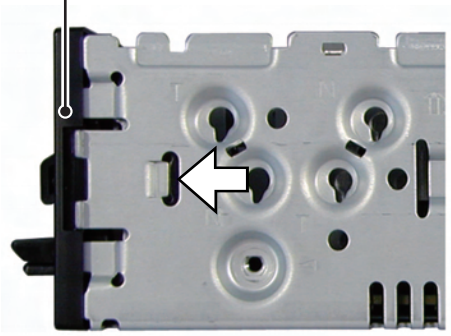


Fig.8

● Removing the Panel Unit(Fig.9,10)

1 Remove the two screws.(Fig.9)

Fig.9

Remove the Holder
and then remove Panel Unit.(Fig.10)

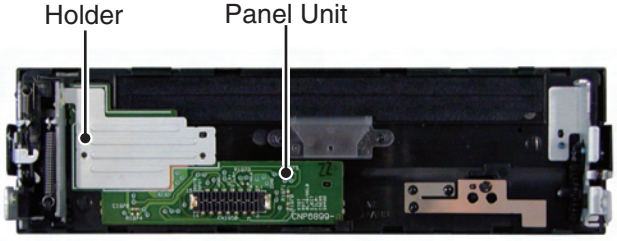


Fig.10

● Removing the Tuner amp Unit(Fig.11,12)

1 Remove the three screws.(Fig.11)

2 Remove the two screws.(Fig.11)

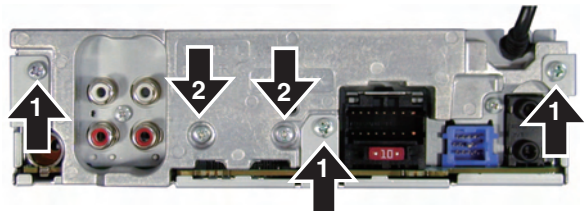


Fig.11

3 Straighten the tabs at four locations indicated.(Fig.12)

4 Remove the screw and then remove the Tuner amp Unit.(Fig.12)

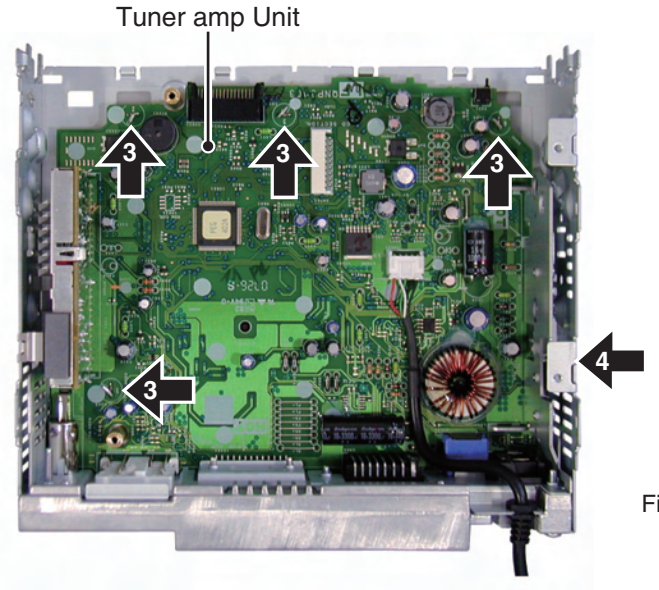
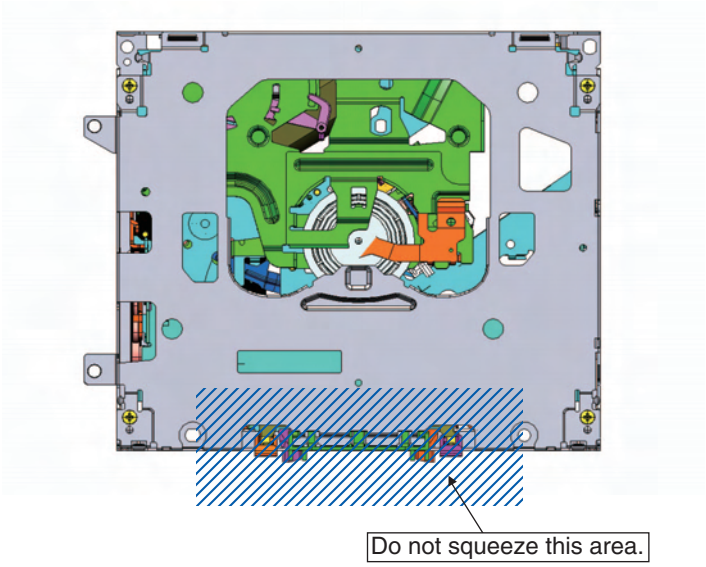


Fig.12

● How to hold the Mechanism Unit

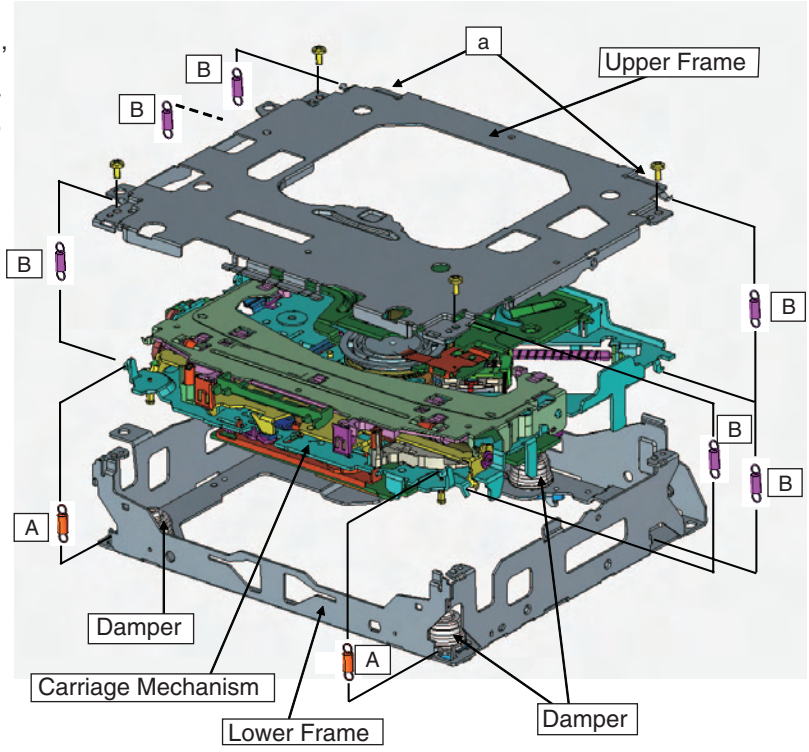
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

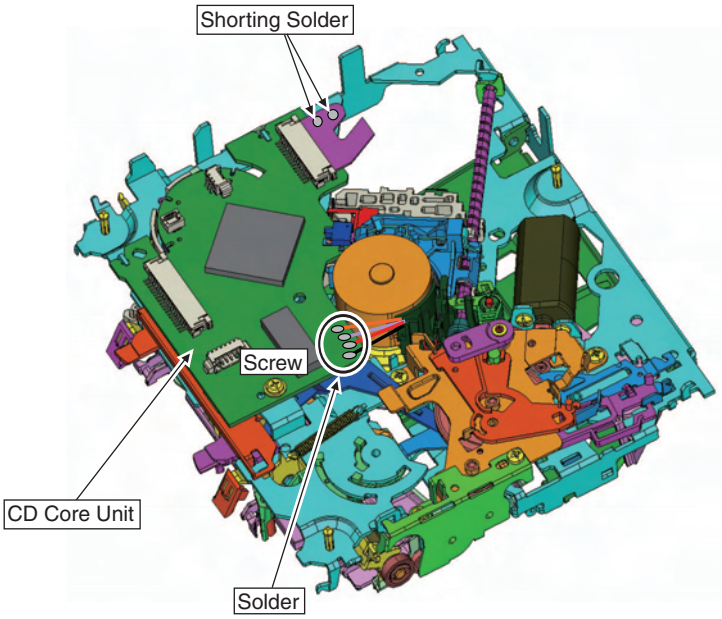
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.



● How to remove the CD Core Unit

1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.

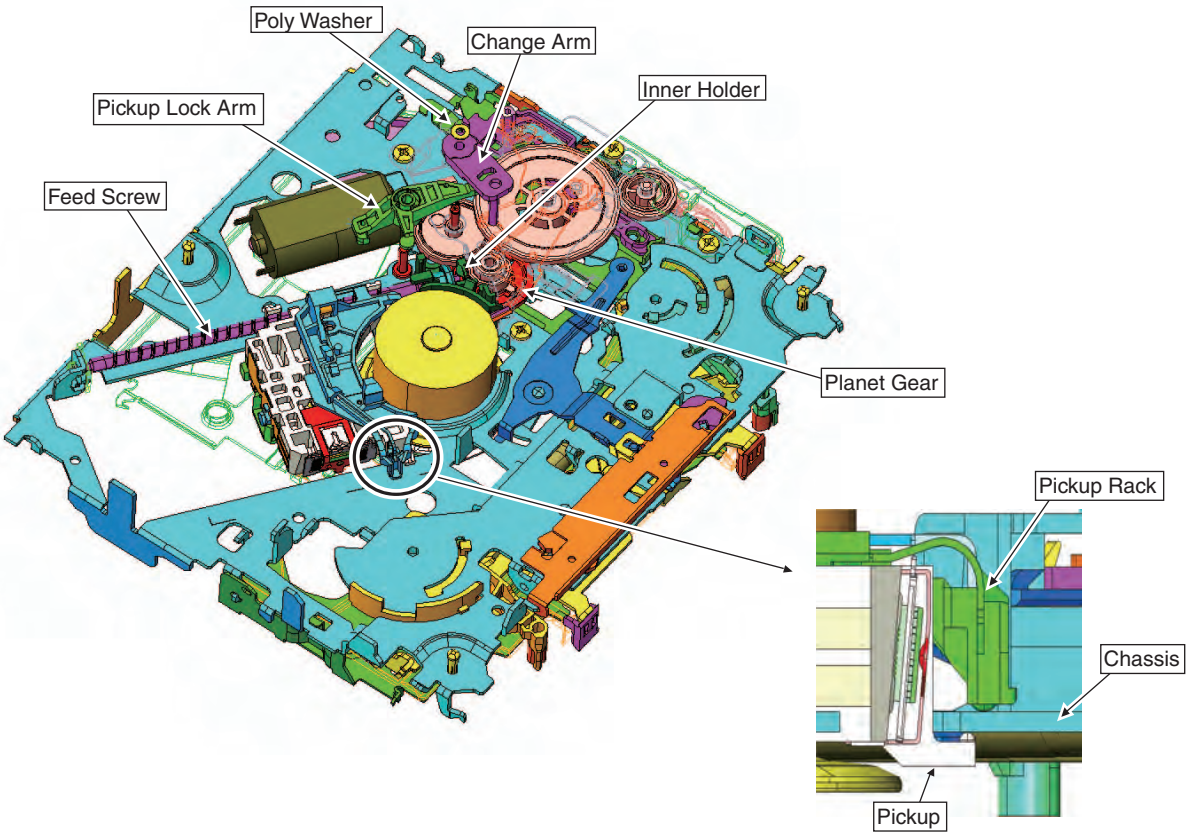


● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.

Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



8. EACH SETTING AND ADJUSTMENT
8.1 CD ADJUSTMENT

1) Cautions on adjustments

• In this product the single voltage (3.3 V) is used for the regulator. The reference voltage is the REFO1 (1.65 V) instead of the GND.
If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:
a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments. Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.
b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.
c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

• For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

• The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

• The load and eject operation is not guarantied with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.
• To enter the test mode.
While pressing the 4 and 6 keys at the same time, reset.
• To exit from the test mode.
Turn off the ACC and back up.

Notes:
a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.
b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.
c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.
d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.
e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0 dB, and the auto-adjustment values are reset to the default settings.

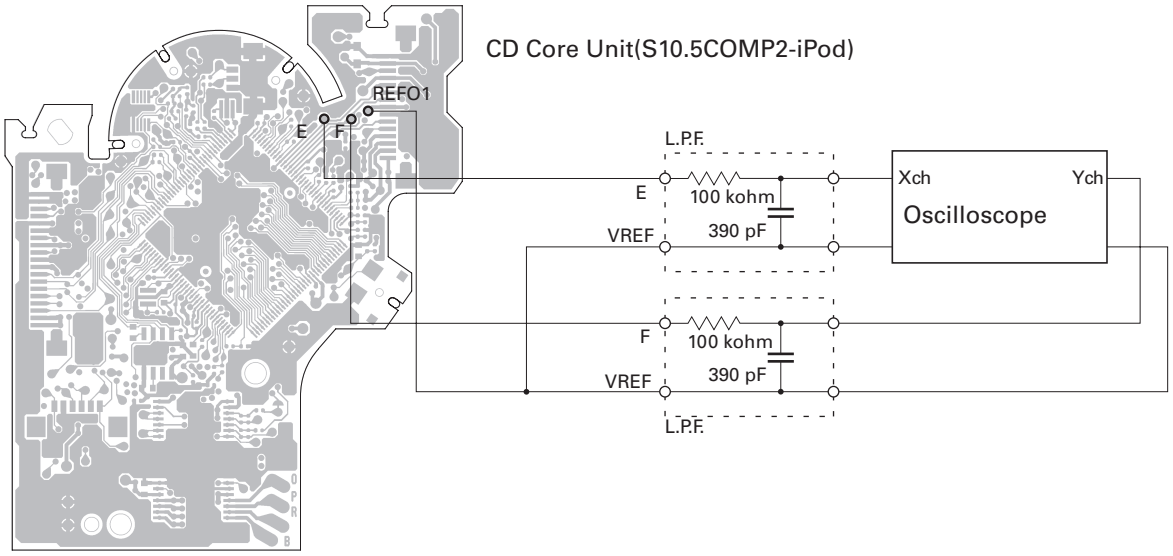
8.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

- **Note :**
  The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

- **Purpose :**
  To check that the grating is within an acceptable range when the PU unit is changed.

- **Symptoms of Mal-adjustment :**
  If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

- **Method :**
- Measuring Equipment • Oscilloscope, Two L.P.F.
- Measuring Points • E, F, REFO1
- Disc • TCD-782
- Mode • TEST MODE



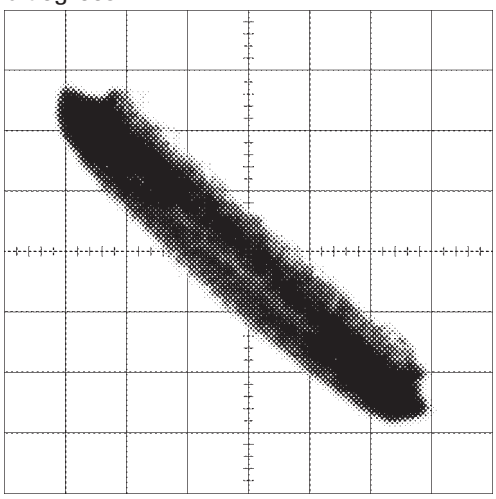
- **Checking Procedure**
1. In test mode, load the disc and switch the 3 V regulator on.
2. Using the → and ← buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75 degrees. Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75 degrees try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75 degrees then the mechanism should be judged to be at fault.

- **Note**
  Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.
- **Hint**
  Reloading the disc changes the clamp position and may decrease the "wobble".

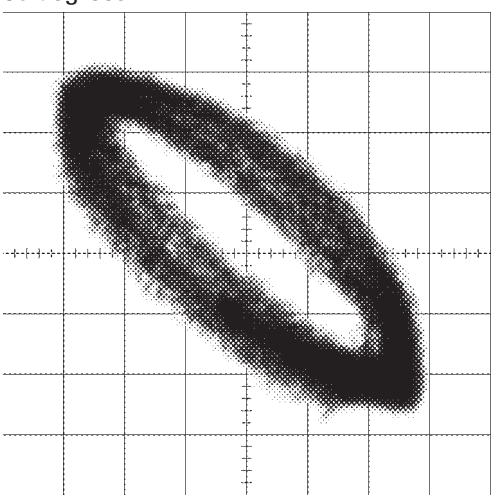
Grating waveform

Ech -> Xch 20 mV/div, AC
Fch -> Ych 20 mV/div, AC

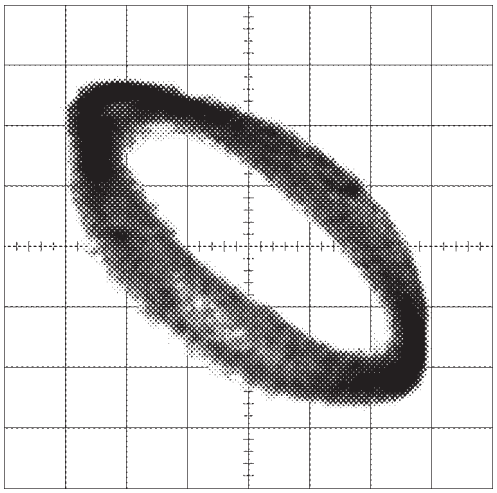
0 degrees



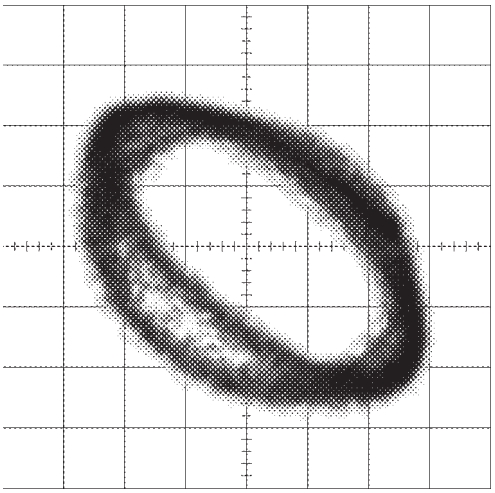
30 degrees



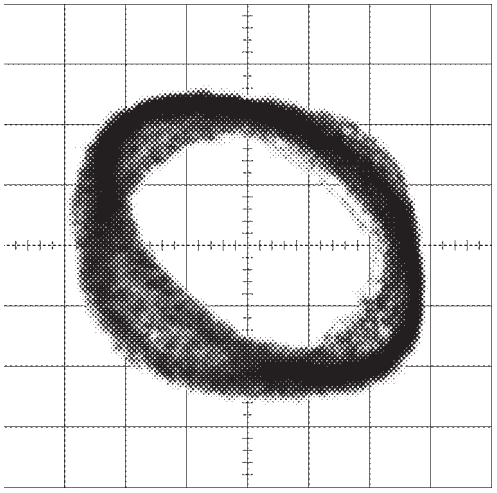
45 degrees



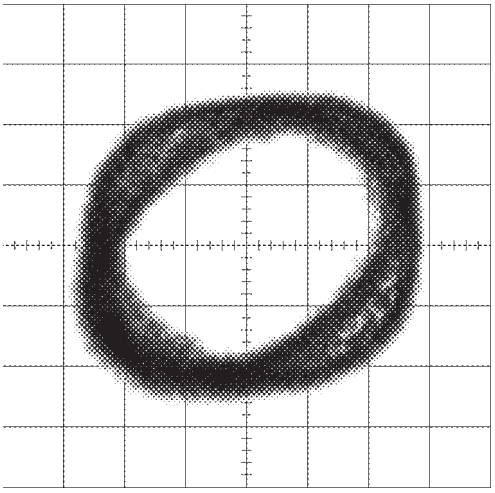
60 degrees



75 degrees



90 degrees



8.3 PCL OUTPUT CONFIRMATION

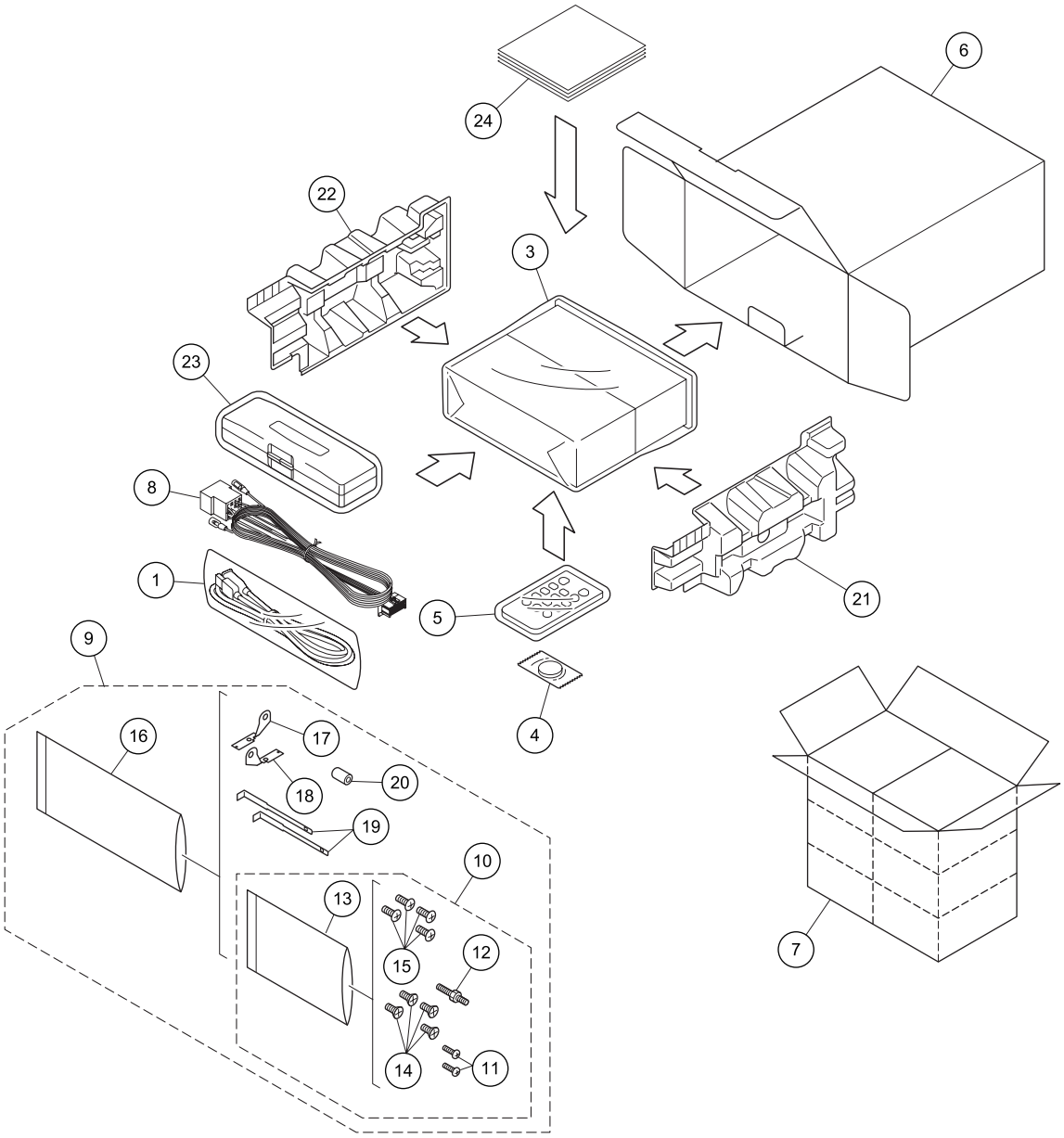
● PCL output

In the normal operation mode (with the detachable panel installed, the ACC switched ON, the standby mode cancelled), shift the TESTIN IC601(Pin 61) terminal to H.
The clock signal is output from the PCL terminal IC601(Pin 37).
The frequency of the clock signal is 468 750 Hz that is one 32th of the fundamental frequency.

9. EXPLODED VIEWS AND PARTS LIST

NOTES : • *Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.*
• *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
• *Screw adjacent to ▽ mark on the product are used for disassembly.*
• *For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions,apply as you think it appropriate.)*

9.1 PACKING



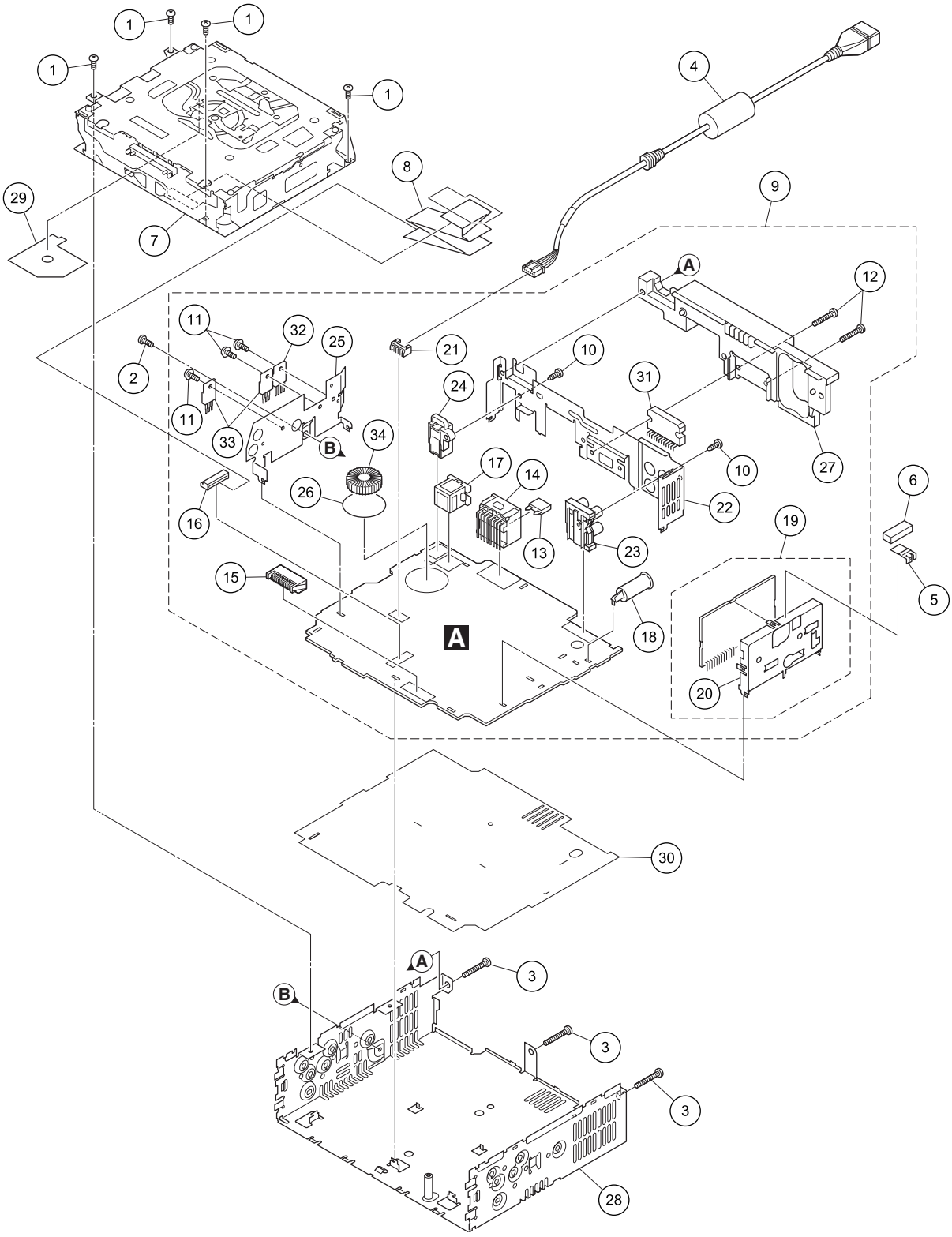
PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Cord Assy	CDP1040
	2	•••••	
	3	Polyethylene Bag	CEG1227
*	4	Battery	CEX1065
	5	Remote Control Assy	CXC8885
	6	Unit Box	QHG3001
	7	Contain Box	QHL3001
	8	Cord Assy	XDP7003
	9	Accessory Assy	XEA7011
	10	Screw Assy	CEA5317
	11	Screw	BPZ20P060FTB
	12	Screw	CBA1650
*	13	Polyethylene Bag	CEG-127
	14	Screw	CRZ50P090FTC
	15	Screw	TRZ50P080FTC
	16	Polyethylene Bag	CEG1160
	17	Holder(L)	CND1249
	18	Holder(R)	CND1250
	19	Handle	CND3707
	20	Bush	CNV3930
	21	Protector	XHP7016
	22	Protector	XHP7017
	23	Case Assy	QXA3049
*	24-1	Caution Card	QRP3001
*	24-2	Warranty Card	CRY1265
	24-3	Owner's Manual	QRD3001
	24-4	Owner's Manual	QRD3002
	24-5	Owner's Manual	QRD3003
	24-6	Owner's Manual	QRB3006
	24-7	Installation Manual	QRD3005

Owner's Manual,Installation Manual

Part No.	Language
QRD3001	English, Spanish
QRD3002	German, French
QRD3003	Italian, Dutch
QRB3006	Russian
QRD3005	English, Spanish, German, French, Italian, Dutch, Russian

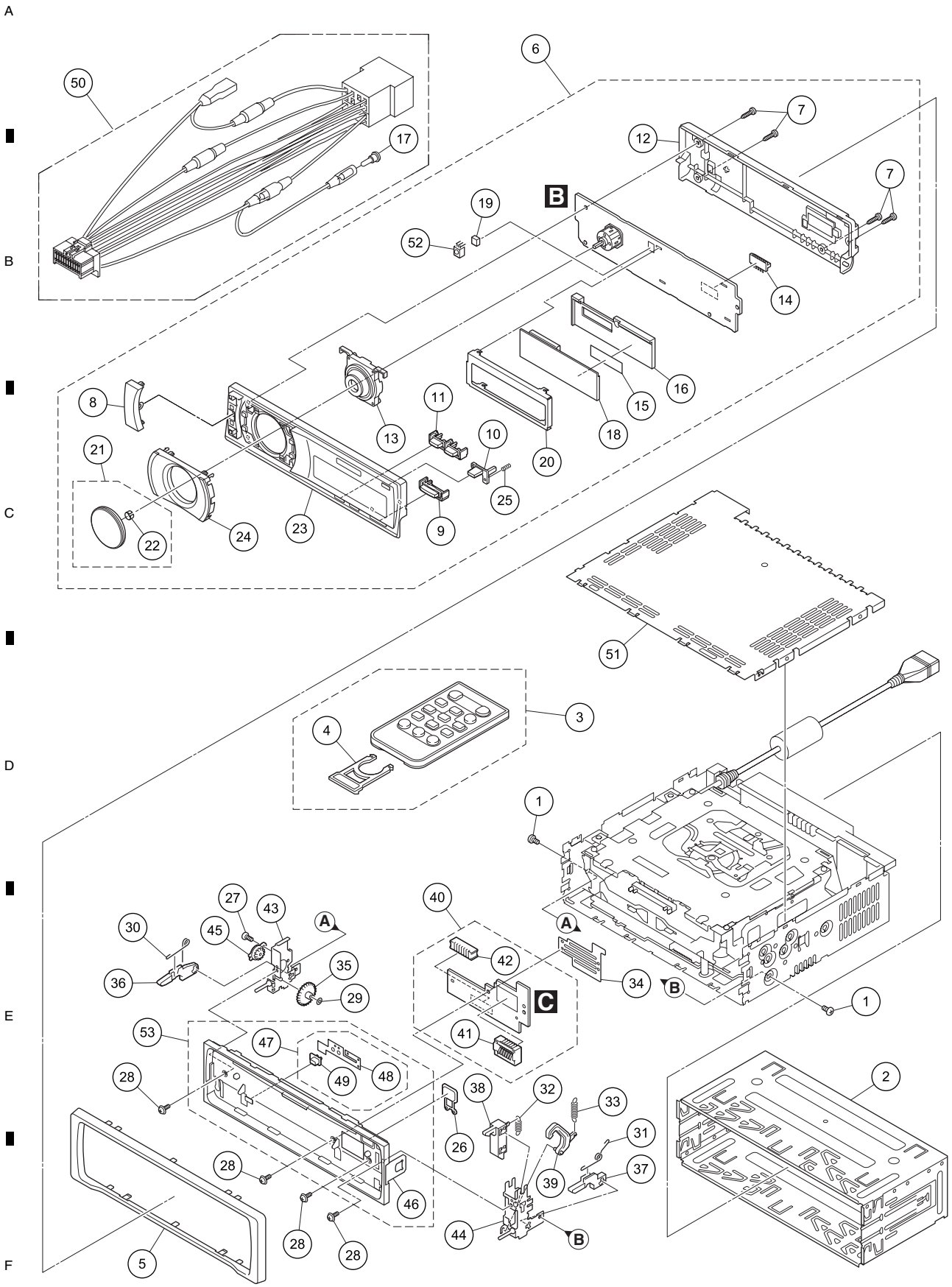
9.2 EXTERIOR(1)



EXTERIOR(1) SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Screw	BSZ26P060FTC
	2	Screw	BSZ30P060FTC
	3	Screw	BSZ30P200FTC
	4	Cord Assy	CDE8351
	5	Earth Plate	CNC8915
	6	Cushion	CNM8890
	7	CD Mechanism Module(S10.5)	CXK5770
	8	Cable	QDE3001
	9	Tuner Amp Unit	QWM3010
	10	Screw	BPZ26P070FTC
	11	Screw	BSZ26P060FTC
	12	Screw	BSZ26P200FTC
⚠	13	Fuse(10 A)	YEK5001
	14	Plug(CN981)	CKM1376
	15	Plug(CN801)	CKS3537
	16	Connector(CN701)	CKS3833
	17	Connector(CN101)	CKS5271
	18	Antenna Jack(ANT401)	CKX1056
	19	FM/AM Tuner Unit	CWE2097
	20	Holder	CND4324
	21	Plug(CN521)	KM200NA5L
	22	Holder	QNC3003
	23	Pin Jack(CN301)	CKB1051
	24	Jack(CN151)	XKS7005
	25	Holder	XNC7030
	26	Insulator	XNM7031
	27	Heat Sink	YNR5031
	28	Chassis Unit	QXA3013
	29	Insulator	XNM7106
	30	Insulator	CNN2339
	31	IC(IC351)	PAL007C
	32	IC(IC911)	NJM2388F84
	33	Transistor(Q751,Q901)	2SD2396
	34	Choke Coil(L981)	CTH1280

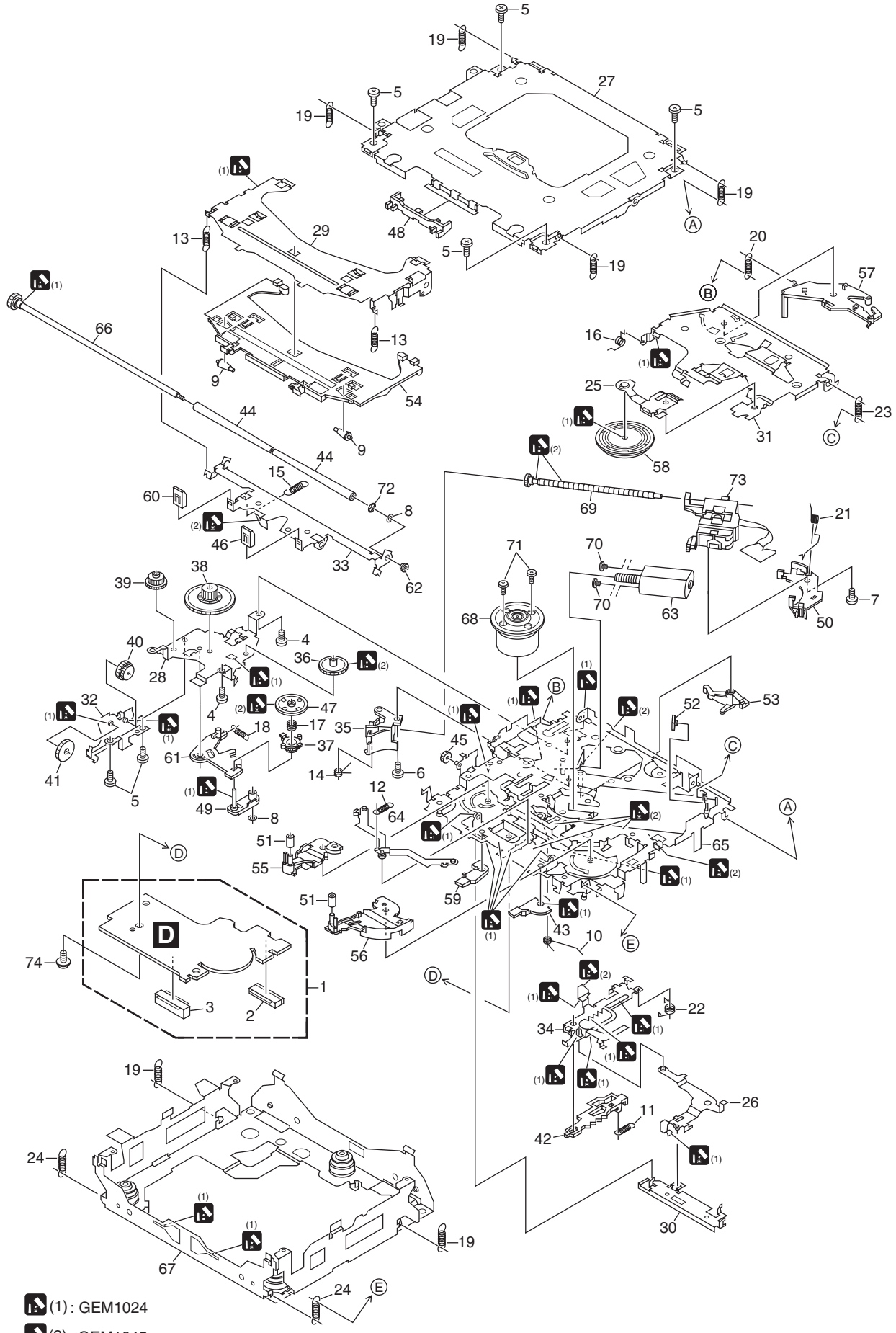
9.3 EXTERIOR(2)



EXTERIOR(2) SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Screw	BMZ30P040FTB
	2	Holder	CND3598
	3	Remote Control Assy	CXC8885
	4	Cover	CNS7068
	5	Panel	QNS3004
	6	Detach Grille Assy	QXA3001
	7	Screw	BPZ20P080FTB
	8	Button(SRC, BAND)	QAC3004
	9	Button(LIST)	QAC3005
	10	Button(OPEN)	QAC3007
	11	Button(MUTE, TA)	QAC3006
	12	Cover	QNS3002
	13	Lighting Conductor	QNV3001
	14	Connector(CN1901)	CKS5207
	15	Double Side Tape	CNN1878
	16	Holder	CNV9735
	17	Cap	CKX-003
	18	OLED	MXS8249
	19	Spacer	QNM3006
	20	Holder	XNC7028
	21	Knob Unit	QXA3006
	22	Spring	XBL7005
	23	Grille Unit	QXA3007
	24	Button Unit(DISP, RDM, S.Rtrv, RPT)	QXA3010
	25	Spring	XBH7001
	26	Button(EJECT)	CAC7752
	27	Screw(M2 x 4)	CBA1649
	28	Screw(M2 x 4.5)	CBA1925
	29	Washer	CBF1038
	30	Spring	CBH2650
	31	Spring	CBH2651
	32	Spring	CBH2652
	33	Spring	CBH2653
	34	Holder	CND1254
	35	Gear	CNV5997
	36	Arm	CNV7400
	37	Arm	CNV7401
	38	Arm	CNV7402
	39	Arm	CNV7403
	40	Panel Unit	CWM8758
	41	Connector(CN1951)	CKS4806
	42	Connector(CN1950)	CKS5192
	43	Holder Unit	CXB9501
	44	Holder Unit	CXB9502
	45	Damper Unit	CXB9503
	46	Panel Unit	QXA3036
	47	Sub Spring Assy	XXA7363
	48	Spring	CBL1512
	49	Pin	CNV6486
	50	Cord Assy	XDP7003
	51	Case	YNB5014
	52	IC(IC1901)	GP1UX51RK
	53	Sub Panel Assy	QXA3025

9.4 CD MECHANISM MODULE



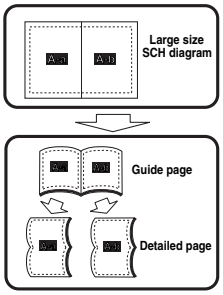
CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	CD Core Unit(S10.5COMP2-iPod)	CWX3526
	2	Connector(CN101)	CKS4182
	3	Connector(CN701)	CKS4186
	4	Screw	BMZ20P025FTC
	5	Screw	BSZ20P040FTC
	6	Screw(M2 x 3)	CBA1511
	7	Screw(M2 x 4)	CBA1835
	8	Washer	CBF1038
	9	Roller	CNV9499
	10	Spring	CBH2609
	11	Spring	CBH2612
	12	Spring	CBH2614
	13	Spring	CBH2616
	14	Spring	CBH2617
	15	Spring	CBH2620
	16	Spring	CBH2855
	17	Spring	CBH2937
	18	Spring	CBH2735
	19	Spring	CBH2854
	20	Spring	CBH2642
	21	Spring	CBH2856
	22	Spring	CBH2857
	23	Spring	CBH2860
	24	Spring	CBH2861
	25	Spring	CBL1686
	26	Arm	CND1909
	27	Frame	CND2582
	28	Bracket	CND2583
	29	Arm	CND3831
	30	Lever	CND2585
	31	Arm	CND2586
	32	Bracket	CND2587
	33	Arm	CND2588
	34	Lever	CND2589
	35	Holder	CNV7201
	36	Gear	CNV7207
	37	Gear	CNV7208
	38	Gear	CNV7209
	39	Gear	CNV7210
	40	Gear	CNV7211
	41	Gear	CNV7212
	42	Rack	CNV7214
	43	Arm	CNV7216
	44	Roller	CNV7218
	45	Gear	CNV7219
	46	Guide	CNV7361
	47	Gear	CNV7595
	48	Guide	CNV7799
	49	Arm	CNV7805
	50	Rack	CNV8342
	51	Roller	CNV8343
	52	Holder	CNV8344
	53	Arm	CNV8345
	54	Guide	CNV9498
	55	Arm	CNV8348
	56	Arm	CNV8349
	57	Arm	CNV8350
	58	Clamper	CNV8365
	59	Arm	CNV8386
	60	Guide	CNV8396
	61	Arm	CNV8413
	62	Collar	CNV8938
	63	Motor Unit(M2)	CXC4026
	64	Arm Unit	CXC4027
	65	Chassis Unit	CXC4028
	66	Gear Unit	CXC4029
	67	Frame Unit	CXC4031
	68	Motor Unit(M1)	CXC7134
	69	Screw Unit	CXC6359
	70	Screw	JFZ20P020FTC
	71	Screw	JGZ17P022FTC
	72	Washer	YE20FTC
	73	Pickup Unit(P10.5)(Service)	CXX1942
	74	Screw	IMS26P030FTC

10. SCHEMATIC DIAGRAM

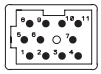
10.1 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

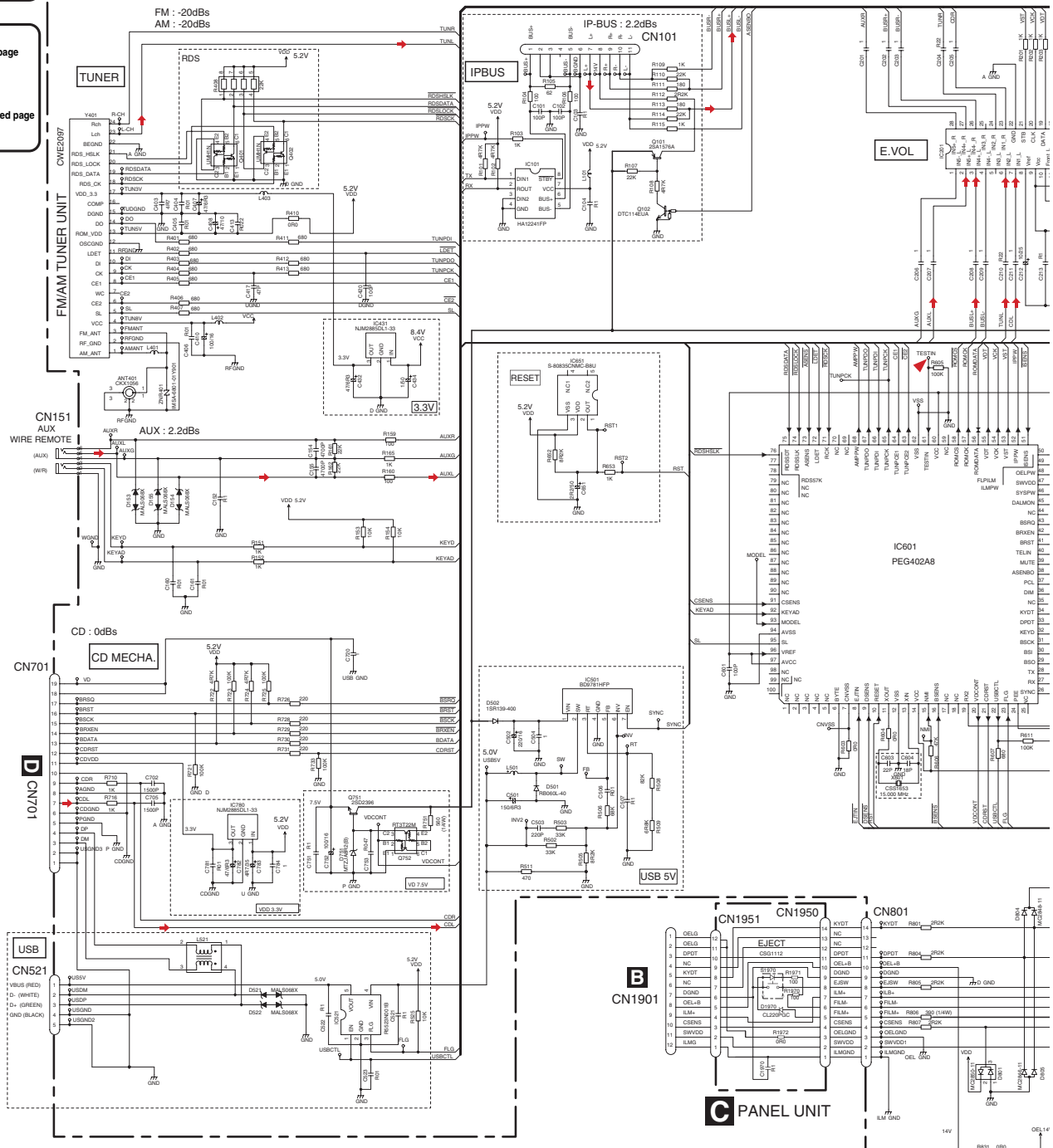
Note: When ordering service parts, be sure to refer to " EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".



A-a

: The power supply is shown with the marked box.





NOTE :

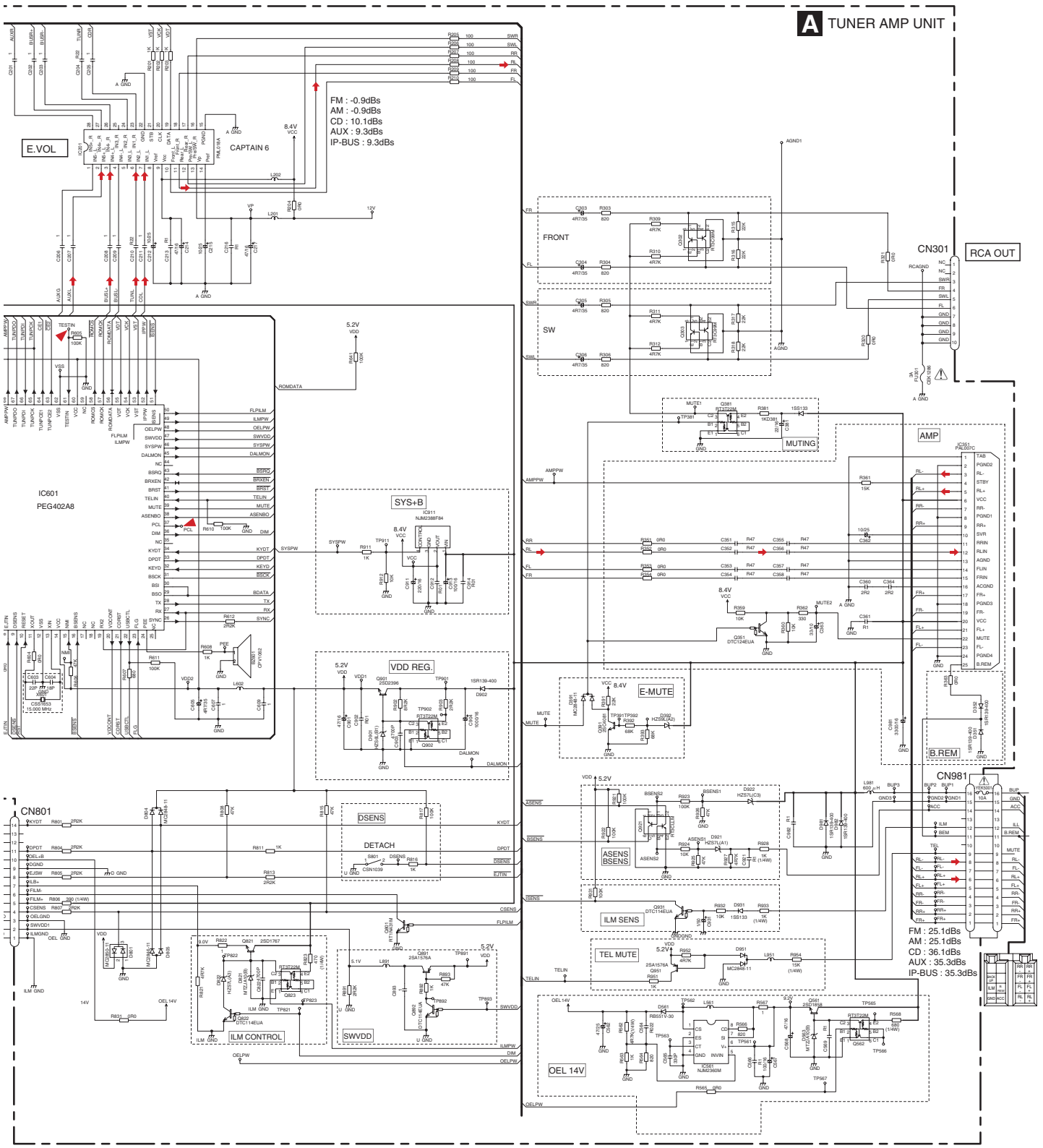
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as :
2.2 → 2R2
0.022 → R022

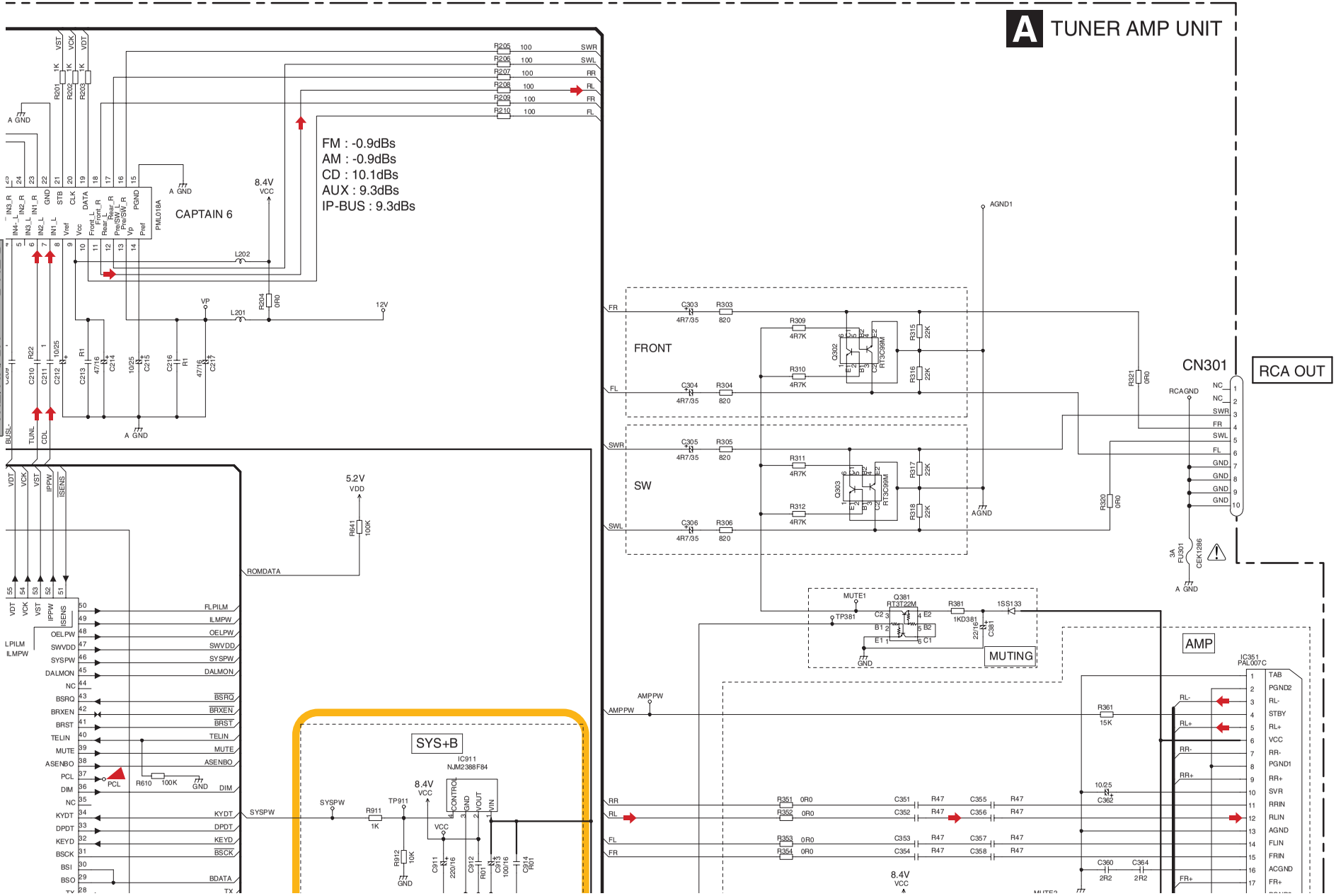
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

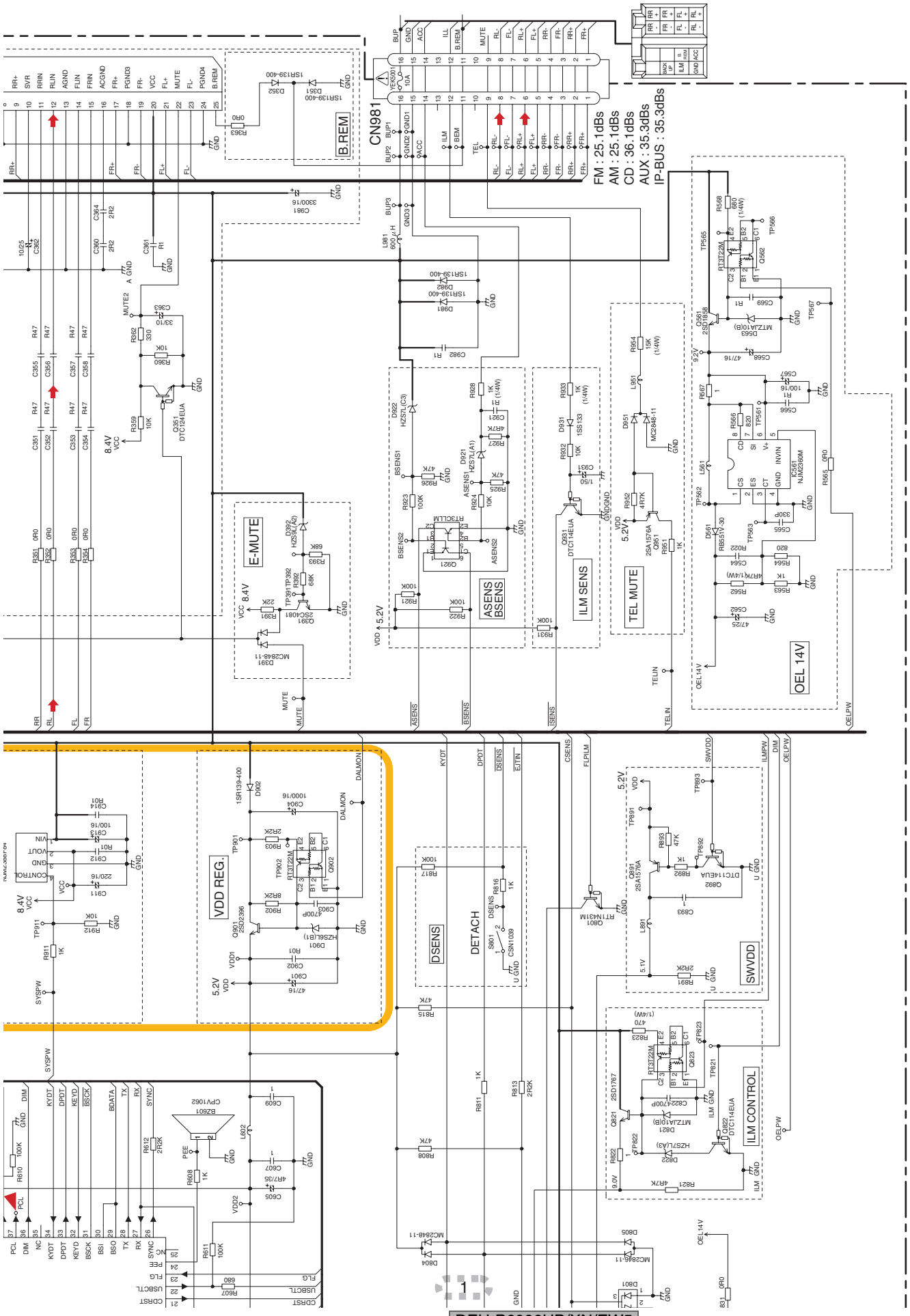
A C

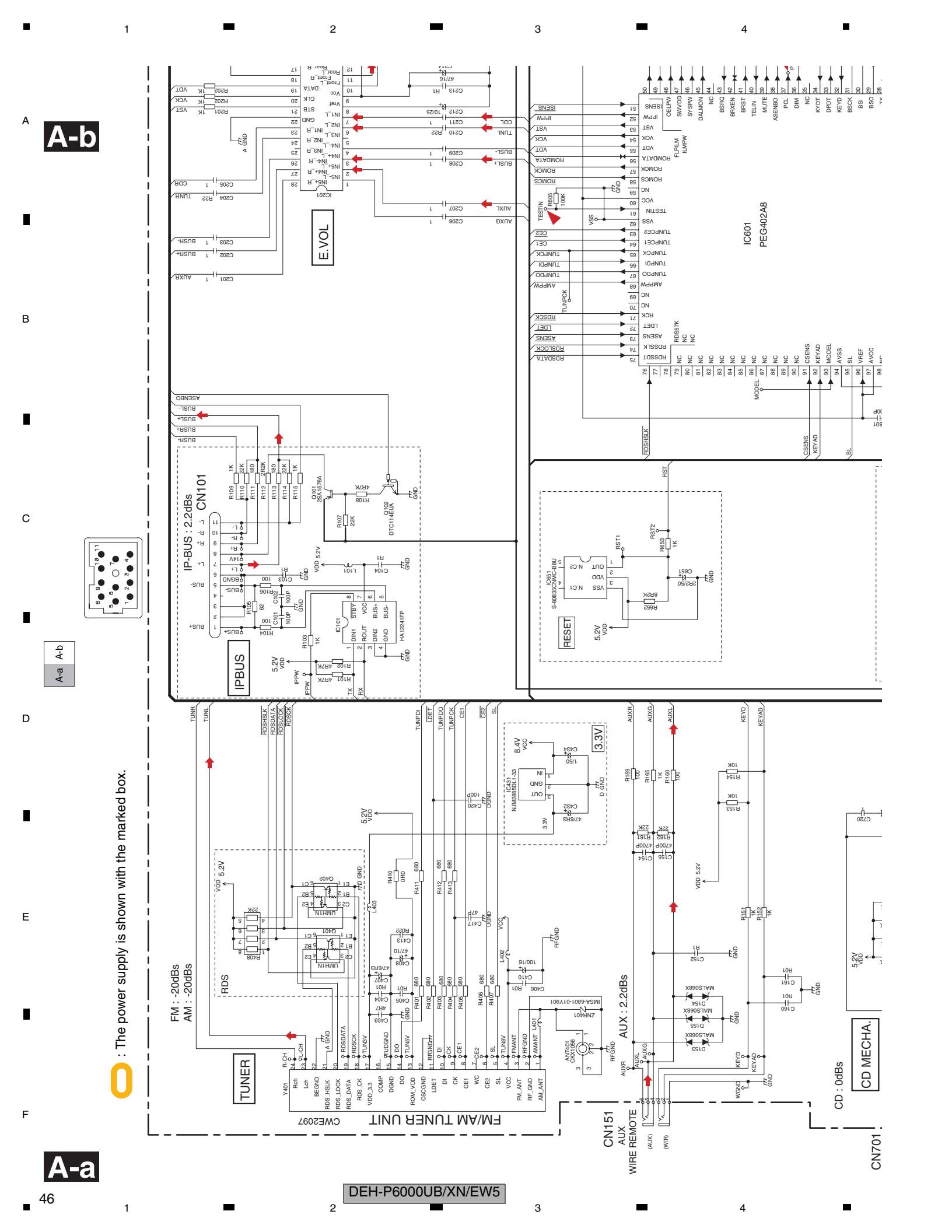
A-b

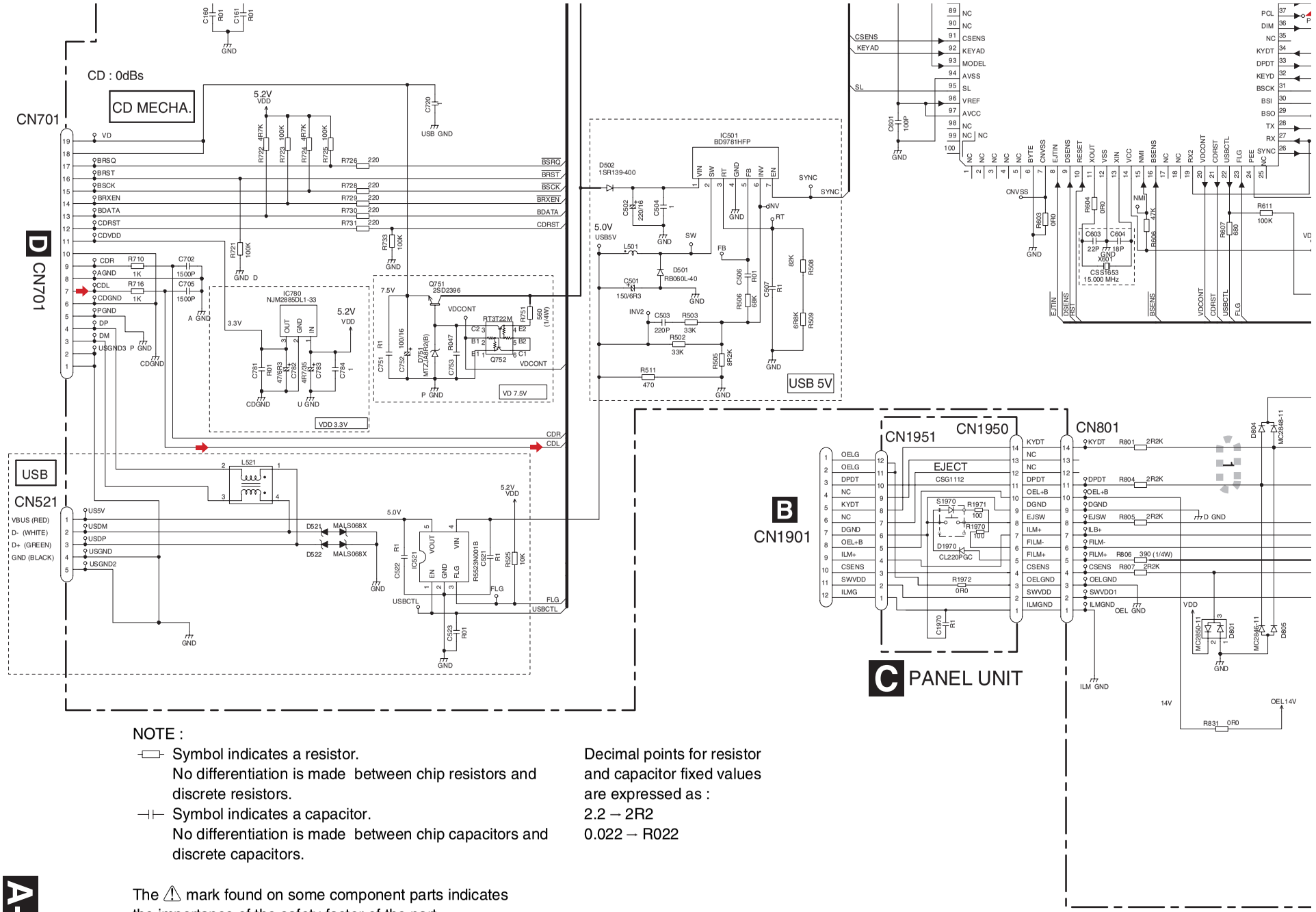

A TUNER AMP UNIT
E.VOL
CAPTAIN 6
FM : -0.9dBs
AM : -0.9dBs
CD : 10.1dBs
AUX : 9.3dBs
IP-BUS : 9.3dBs
IC601
PEG402A8
FRONT
SW
CN301
RCA OUT
MUTING
AMP
SYS+B
VDD REG.
E-MUTE
B.REM
CN981
CN801
DSENS
DETACH
ILM CONTROL
SWVDD
ILM SENS
TEL MUTE
OEL 14V
FM : 25.1dBs
AM : 25.1dBs
CD : 36.1dBs
AUX : 35.3dBs
IP-BUS : 35.3dBs

A TUNER AMP UNIT




CN981
FM : 25.1dBs
AM : 25.1dBs
CD : 36.1dBs
AUX : 35.3dBs
IP-BUS : 35.3dBs
B.REM
E-MUTE
ASENS
BSENS
ILM SENS
TEL MUTE
OEL 14V
VDD REG.
DETACH
DSENS
SWVDD
ILM CONTROL
MUTE
MUTE2
DALMON
SYSPW
OELPW
TELIN
ILMPW
DIM
KYDT
DPDT
KEYD
BSCK
BDATA
TX
RX
SYNC
PCL
CDRST
USBCTL
FLG
PEE


A-b
A-a
: The power supply is shown with the marked box.
FM : -20dBs
AM : -20dBs
AUX : 2.2dBs
CD : 0dBs
IP-BUS : 2.2dBs
IC601
PEG402A8
E.VOL
IPBUS
CN101
RESET
TUNER
RDS
FM/AM TUNER UNIT
CWE2097
CD MECHA.
CN151
AUX
WIRE REMOTE
CN701
3.3V
8.4V
5.2V
A-b
A-a



NOTE :

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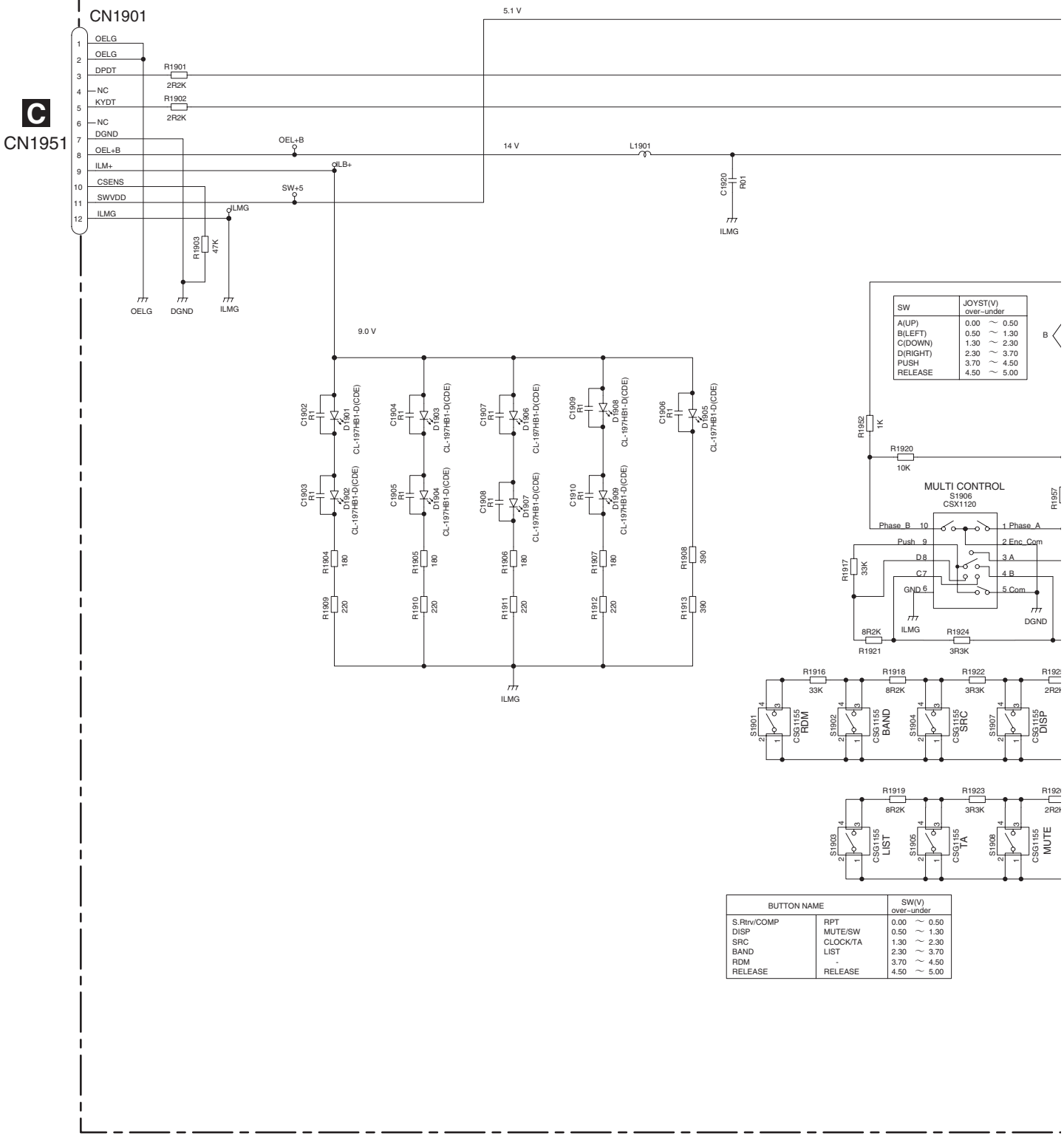
  No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor.
  No differentiation is made between chip capacitors and discrete capacitors.

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.

Decimal points for resistor and capacitor fixed values are expressed as :
2.2 → 2R2
0.022 → R022

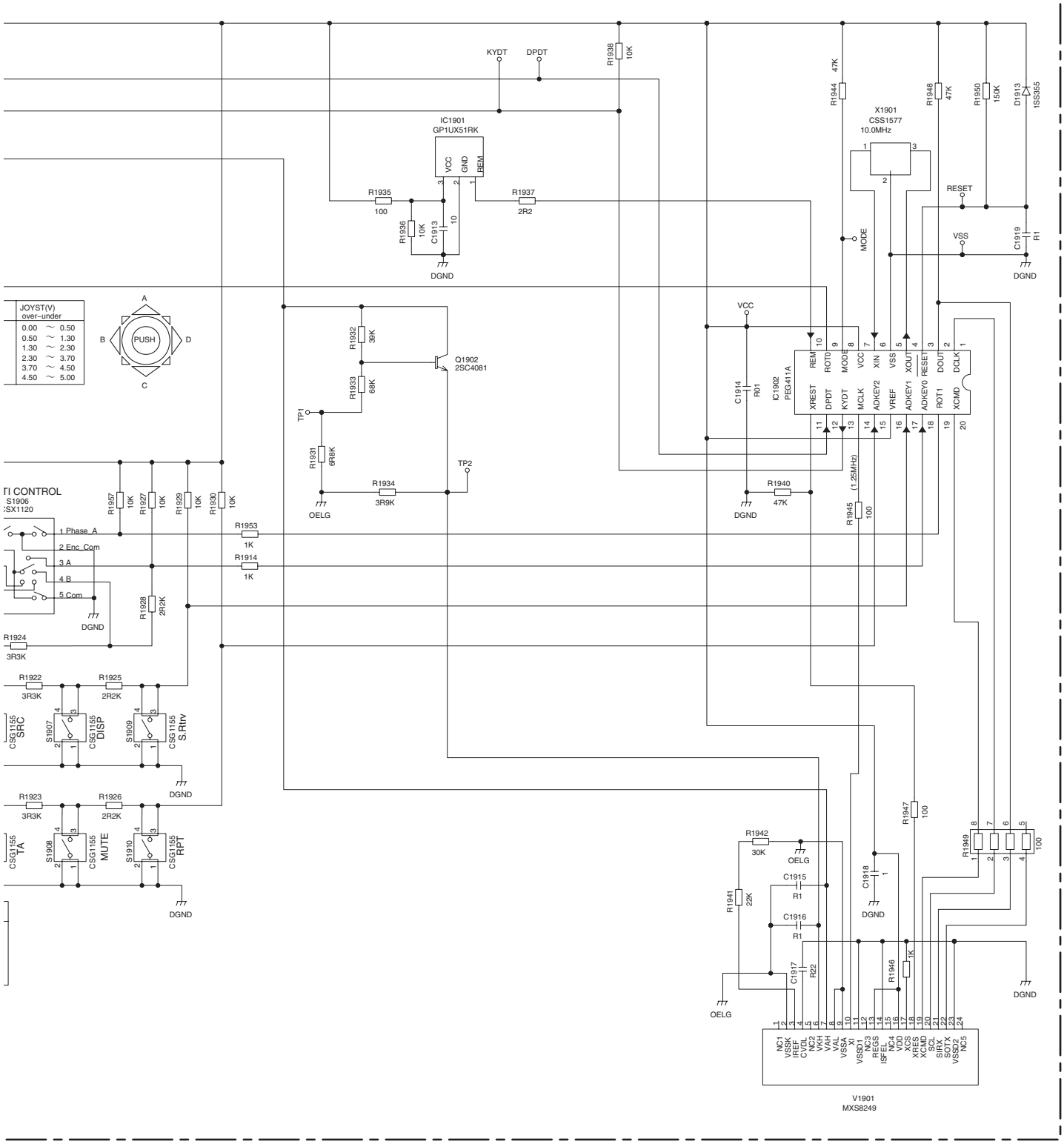
10.2 KEYBOARD UNIT



SW	JOYST(V) over–under
A(UP)	0.00 ~ 0.50
B(LEFT)	0.50 ~ 1.30
C(DOWN)	1.30 ~ 2.30
D(RIGHT)	2.30 ~ 3.70
PUSH	3.70 ~ 4.50
RELEASE	4.50 ~ 5.00

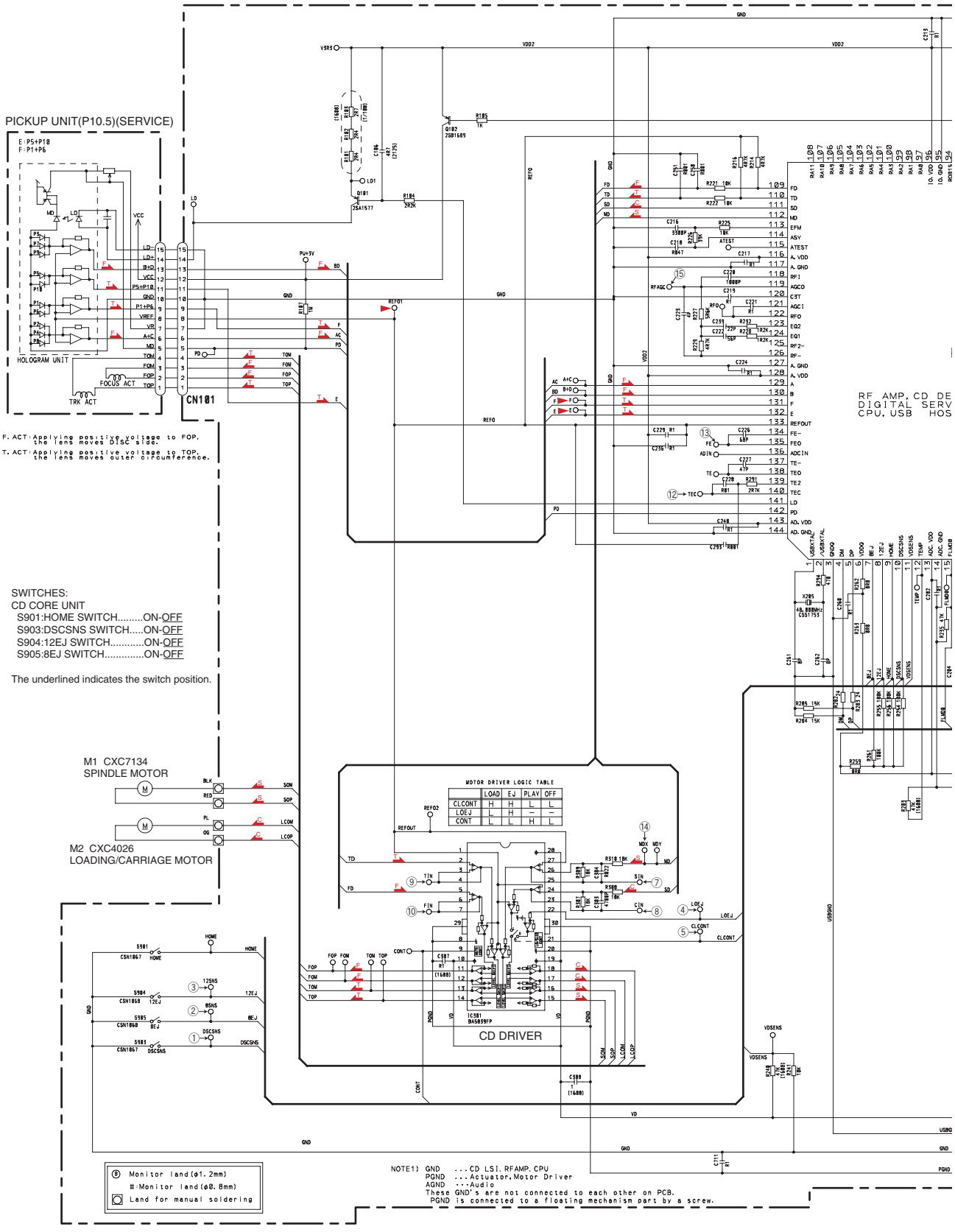
BUTTON NAME		SW(V) over–under
S.Rtrv/COMP	RPT	0.00 ~ 0.50
DISP	MUTE/SW	0.50 ~ 1.30
SRC	CLOCK/TA	1.30 ~ 2.30
BAND	LIST	2.30 ~ 3.70
RDM	-	3.70 ~ 4.50
RELEASE	RELEASE	4.50 ~ 5.00

B KEYBOARD UNIT



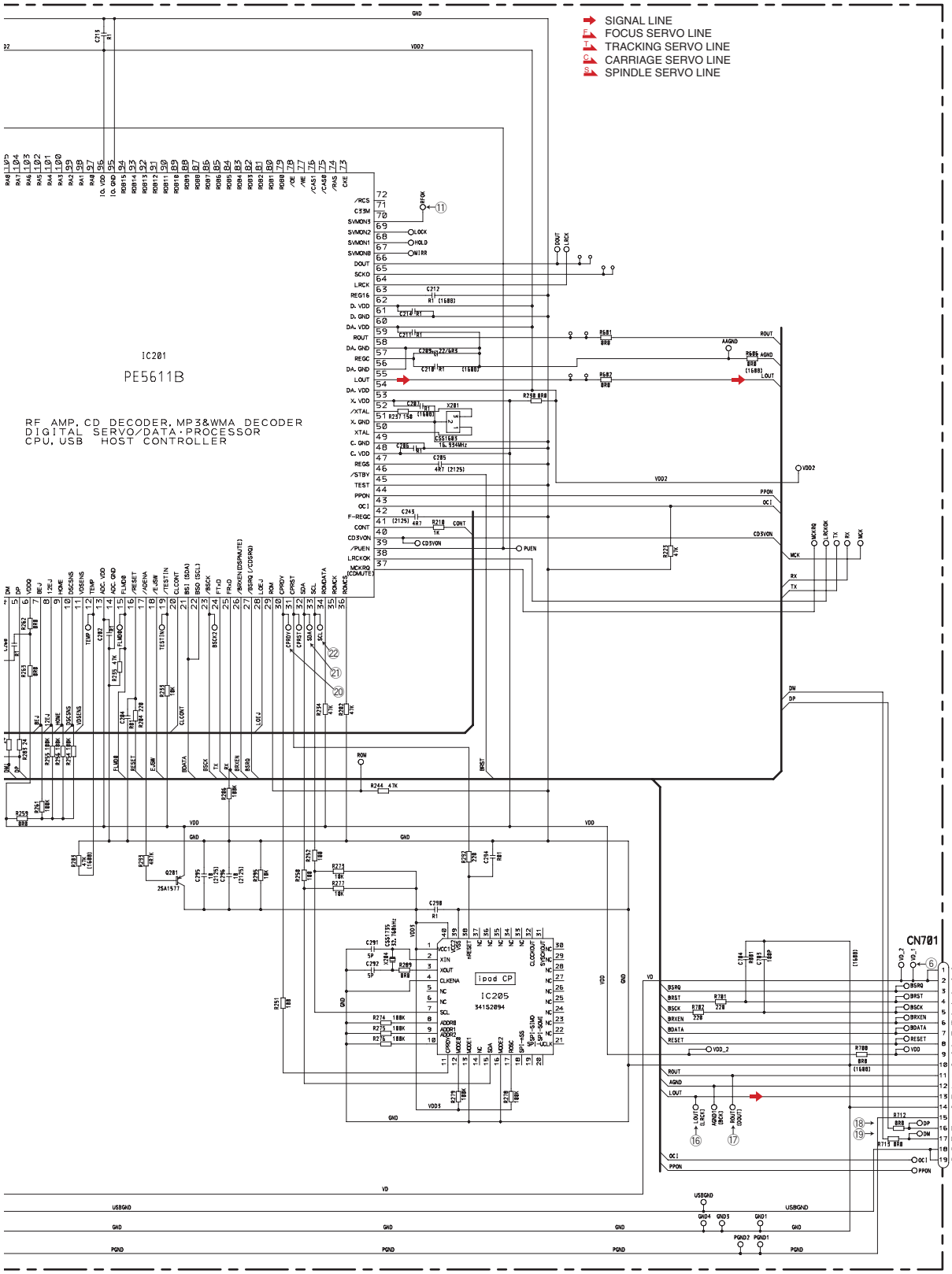
10.3 CD MECHANISM MODULE(GUIDE PAGE)

D-a



D-b

D CD CORE UNIT(S10.5COMP2-iPod)



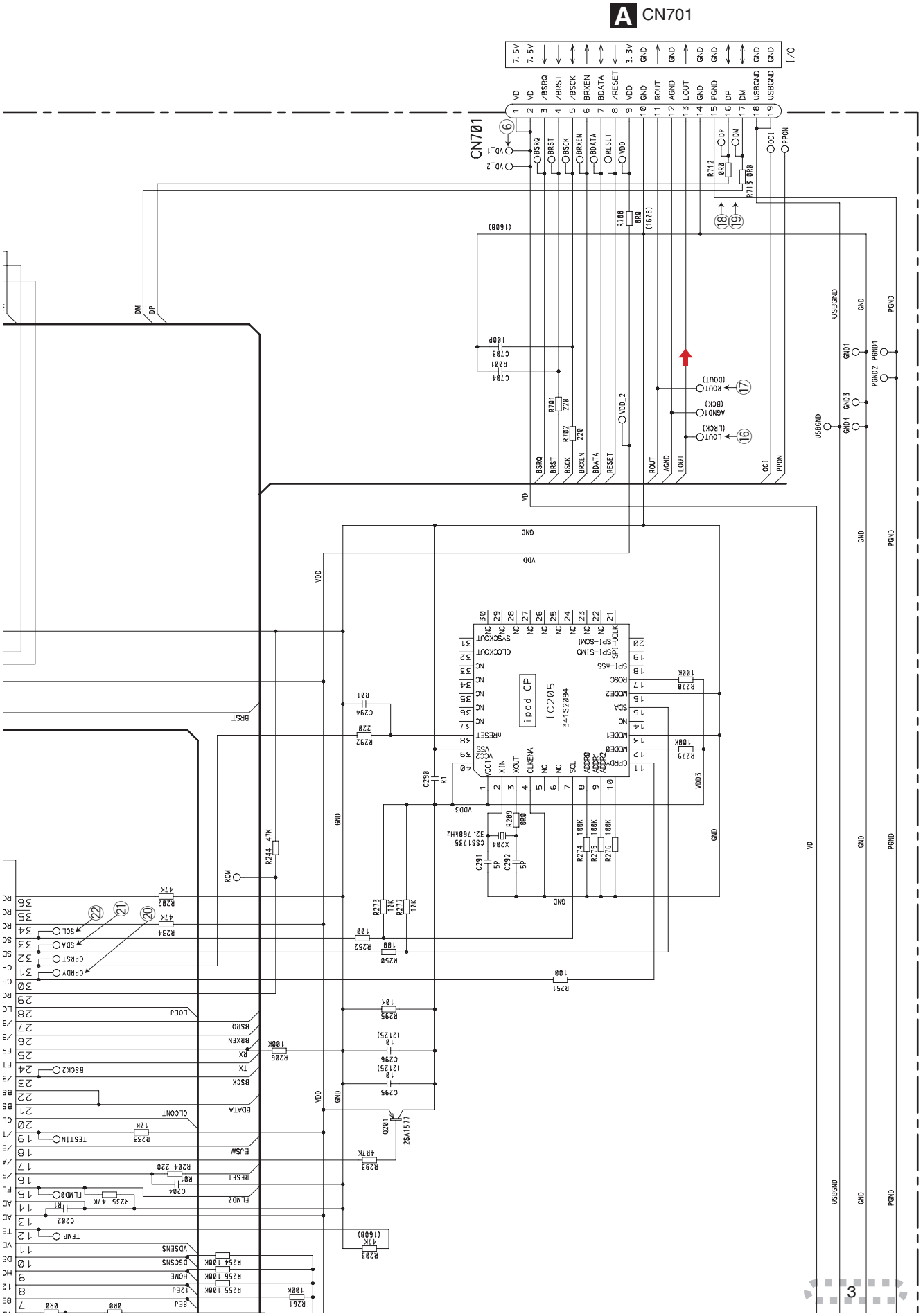
D CD CORE UNIT(S10.5COMP2-iPod)

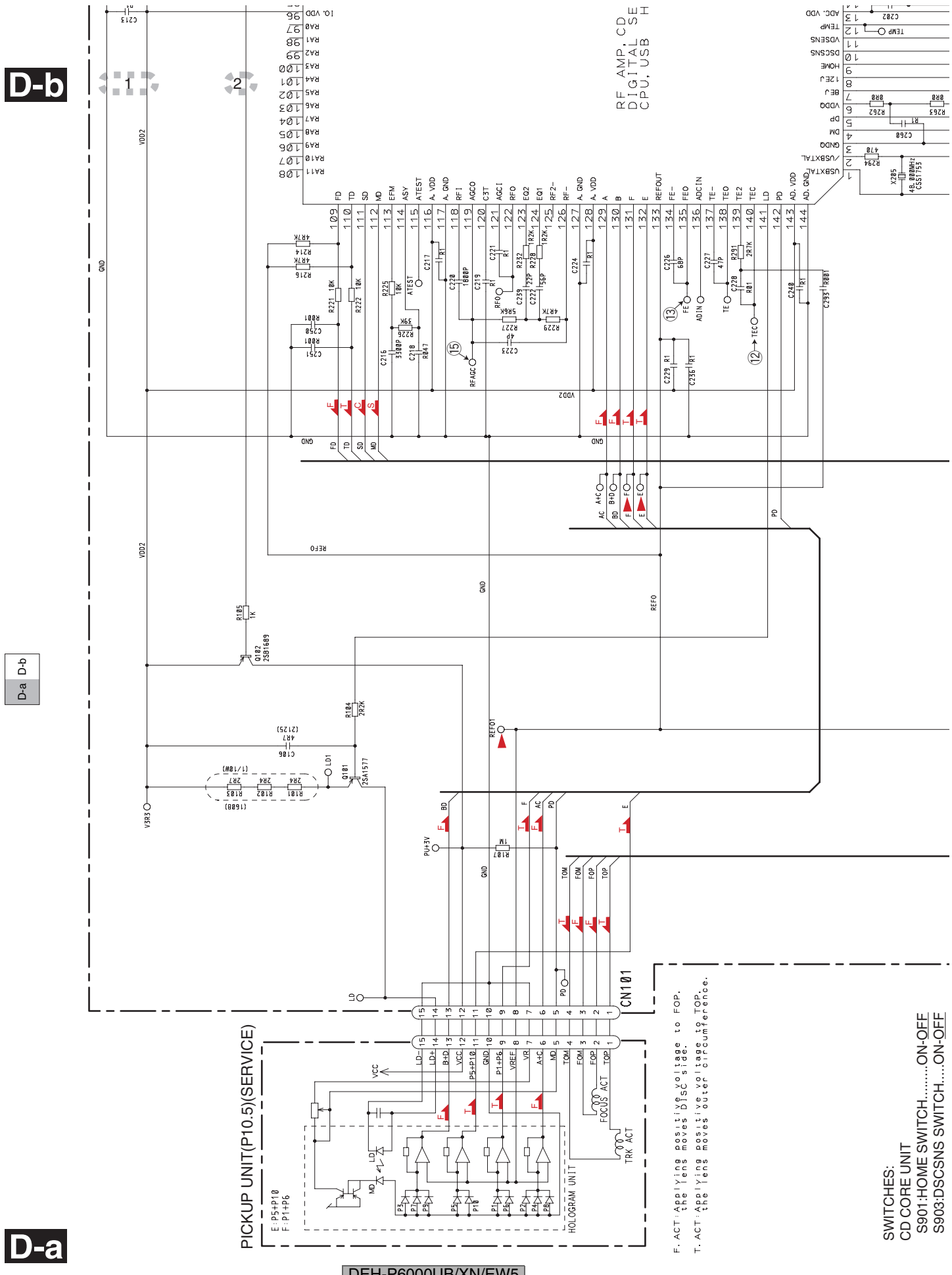
SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE

IC201

PE5611B

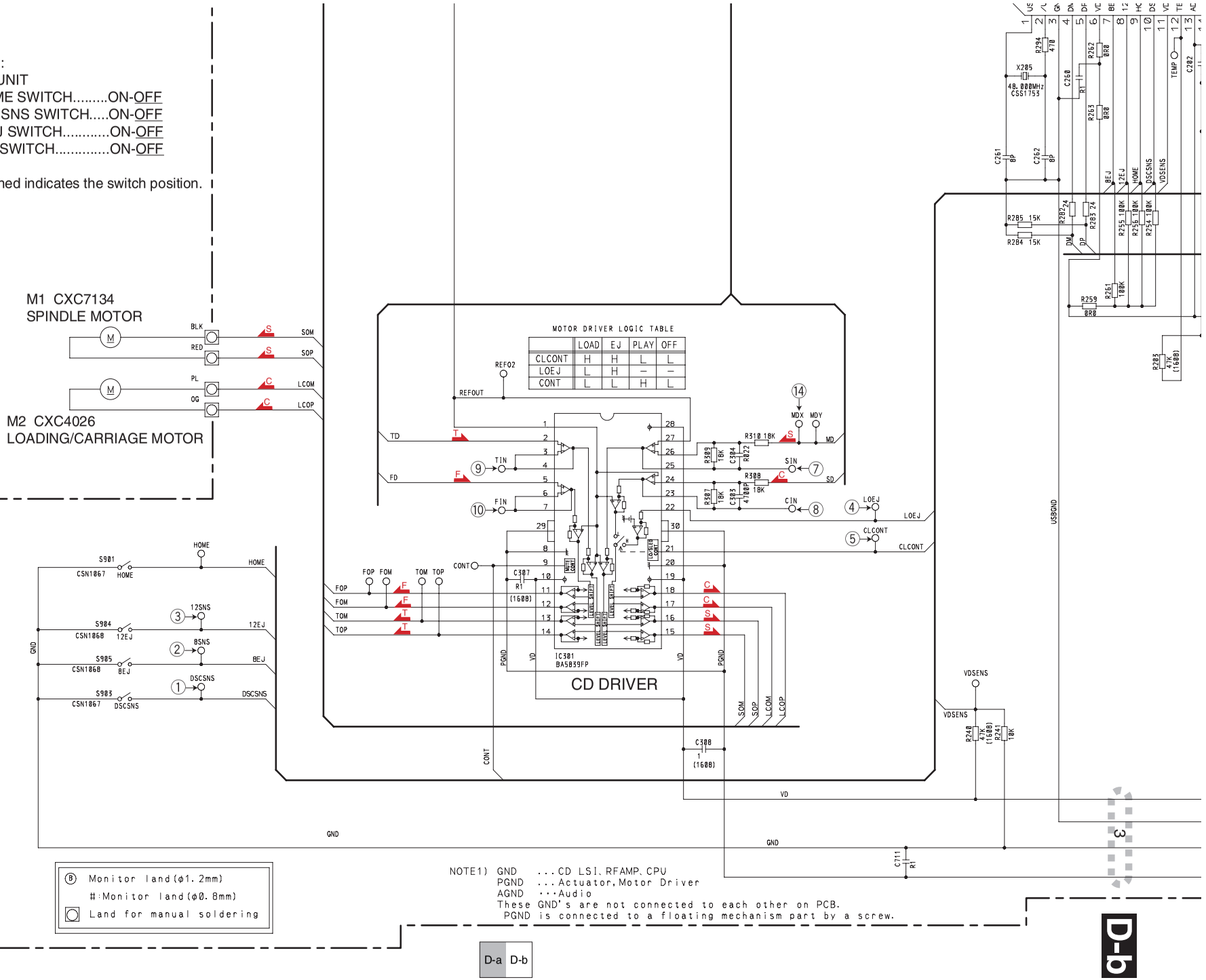
RF AMP, CD DECODER, MP3&WMA DECODER
DIGITAL SERVO/DATA·PROCESSOR
CPU, USB HOST CONTROLLER


A CN701
CN701
IC205
ipod CP
3415Z094
32.768KHZ
CSS1T35
2SA1577
D-a D-b
D-b
3


D-b
D-a
RF AMP, CD DIGITAL SE CPU, USB H
PICKUP UNIT(P10.5)(SERVICE)
E:P5+P10
F:P1+P6
HOLOGRAM UNIT
CN101
F. ACT : Applying positive voltage to FOP. the lens moves DISC side.
T. ACT : Applying positive voltage to TOP. the lens moves outer circumference.
SWITCHES:
CD CORE UNIT
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH....ON-OFF

SWITCHES:
CD CORE UNIT
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF

The underlined indicates the switch position.



D-a D-b

10.4 WAVEFORMS

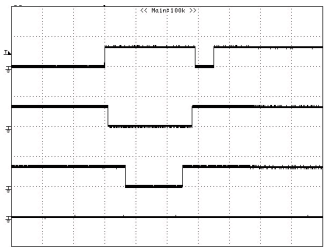
● CD CORE UNIT

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65 V)

①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

12 cm CD Loading operation

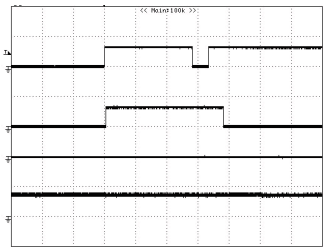
Ref.: GND
Mode: Normal



①DSCSNS	5 V/div	500 ms/div
⑤CLCONT	5 V/div	
④LOEJ	5 V/div	
⑥VD	10 V/div	

12 cm CD Loading operation

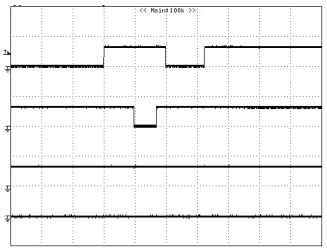
Ref.: GND
Mode: Normal



①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

8 cm CD Loading operation

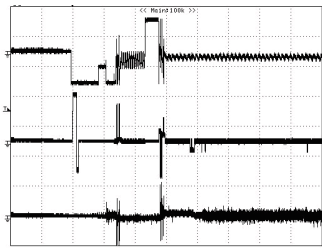
Ref.: GND
Mode: Normal



⑦SIN	1 V/div	1 s/div
⑧CIN	500 mV/div	
⑨TIN	1 V/div	

12 cm CD-DA setup operation after loading

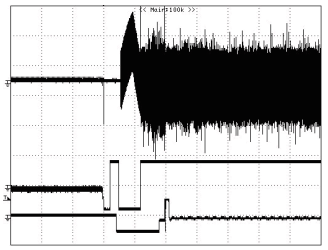
Ref.: REFO
Mode: Normal



⑩FIN	200 mV/div	500 ms/div
⑪RFOK(MONI_3)	2 V/div	
⑦SIN	2 V/div	

12 cm CD-DA Source On setup operation

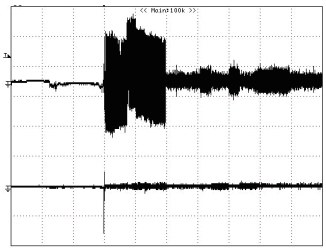
Ref.: REFO
Mode: Normal



⑫TE	500 mV/div	200 ms/div
⑬FE	500 mV/div	

Source On setup operation

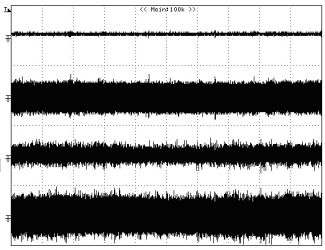
Ref.: REFO
Mode: Normal



⑬FE	500 mV/div	20 ms/div
⑩FIN	500 mV/div	
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

CD-DA Play operation

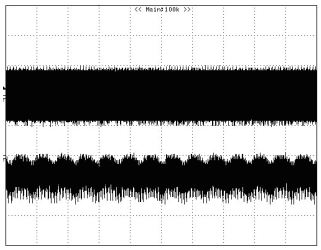
Ref.: REFO
Mode: Normal



⑭MDX	2 V/div	200 ms/div
⑦SIN	500 mV/div	

Spindle waveform during play operation

Ref.: REFO
Mode: Normal



⑭MDX	2 V/div	5 µs/div
⑦SIN	500 mV/div	

Spindle waveform during play operation (Wider)

Ref.: REFO
Mode: Normal

⑩FIN	500 mV/div	200 ms/div
⑬FE	500 mV/div	

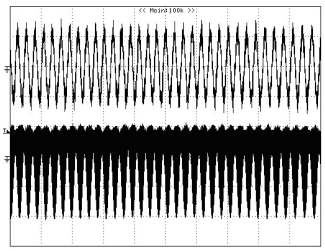
Focus Search waveform

Ref.: REFO
Mode: TEST

⑫TE	500 mV/div	2 ms/div
⑮RFAGC	500 mV/div	

Track Open waveform

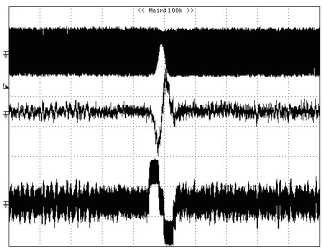
Ref.: REFO
Mode: TEST



⑮RFAGC	1 V/div	500 µs/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

1 Track Jump waveform

Ref.: REFO
Mode: TEST

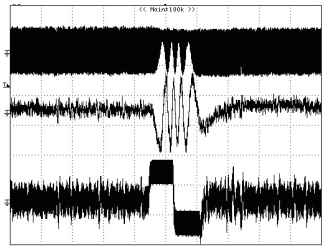


⑮RFAGC	1 V/div	500 µs/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

4 Tracks Jump waveform

Ref.: REFO

Mode: TEST

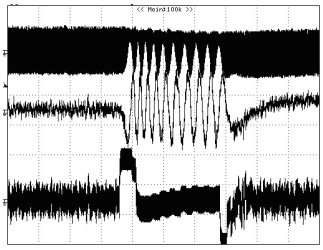


⑮RFAGC	1 V/div	500 µs/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

10 Tracks Jump waveform

Ref.: REFO

Mode: TEST

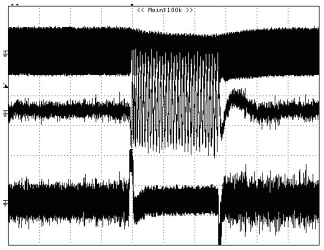


⑮RFAGC	1 V/div	2 ms/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

32 Tracks Jump waveform

Ref.: REFO

Mode: TEST

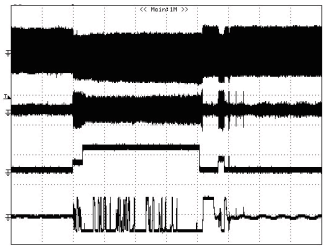


⑮RFAGC	1 V/div	200 ms/div
⑫TE	1 V/div	
⑧CIN	1 V/div	
⑦SIN	2 V/div	

Search operation(Outter to Inner)

Ref.: REFO

Mode: Normal

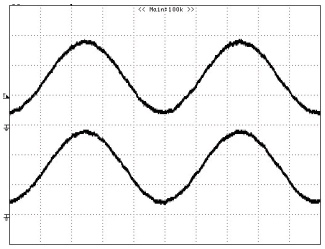


⑯LOUT	1 V/div	200 µs/div
⑰ROUT	1 V/div	

Analog audio waveform

Ref.: AGND

Mode: Normal

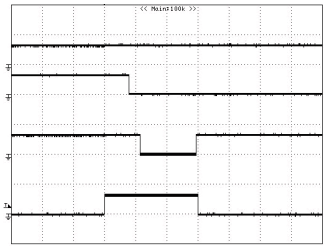


①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

12 cm CD Eject operation

Ref.: GND

Mode: Normal

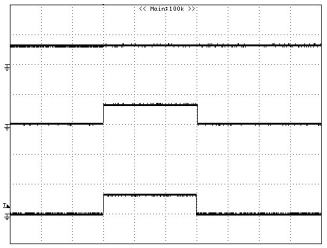


①DSCSNS	5 V/div	500 ms/div
⑤CLCONT	5 V/div	
④LOEJ	5 V/div	

12 cm CD Eject operation

Ref.: GND

Mode: Normal

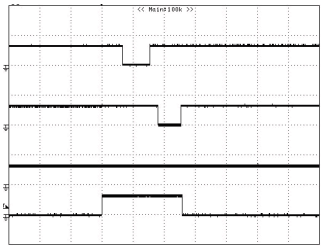


①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

8 cm CD Eject operation

Ref.: GND

Mode: Normal

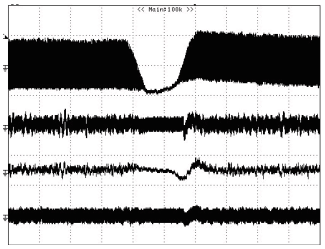


⑮RFAGC	1 V/div	500 µs/div
⑨TIN	1 V/div	
⑫TE	1 V/div	
⑩FIN	1 V/div	

Black dot(800 µm) during play

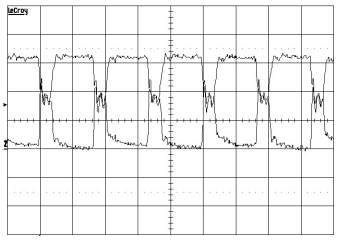
Ref.: REFO

Mode: Normal



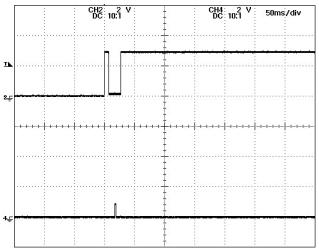
⑱DP	1 V/div	50 ns/div
⑲DM	1 V/div	

USB Play



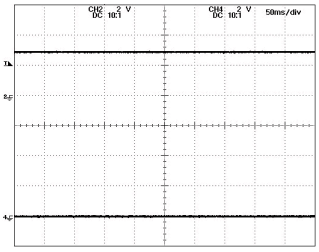
⑱DP	2 V/div	50 ms/div
⑲DM	2 V/div	

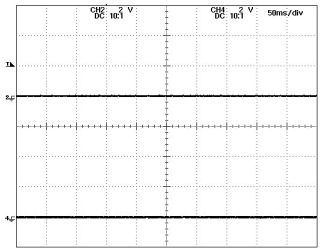
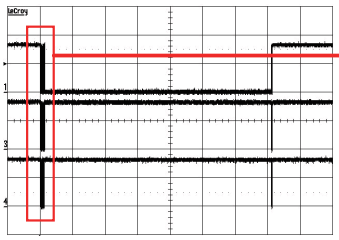
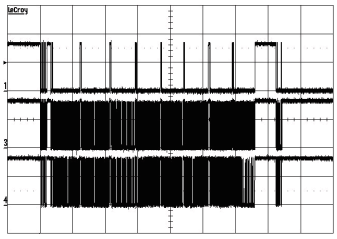
USB device inserting to USB connector.



⑱DP	2 V/div	50 ms/div
⑲DM	2 V/div	

CD Play with USB(iPod) device connecting.



⑱DP 2 V/div 50 ms/div ⑲DM 2 V/div ACC OFF with USB(iPod) device connecting. 	⑳CPRDY 2 V/div 10 s/div ㉑SDA 2 V/div ㉒SCL 2 V/div iPod Authentication Operation 	⑳CPRDY 2 V/div ㉑SDA 2 V/div ㉒SCL 2 V/div iPod Authentication Operation(zoom until 2 s) 

A

B

C

D

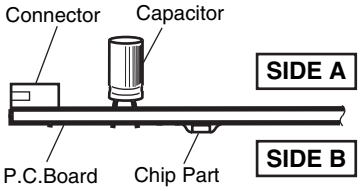
E

F

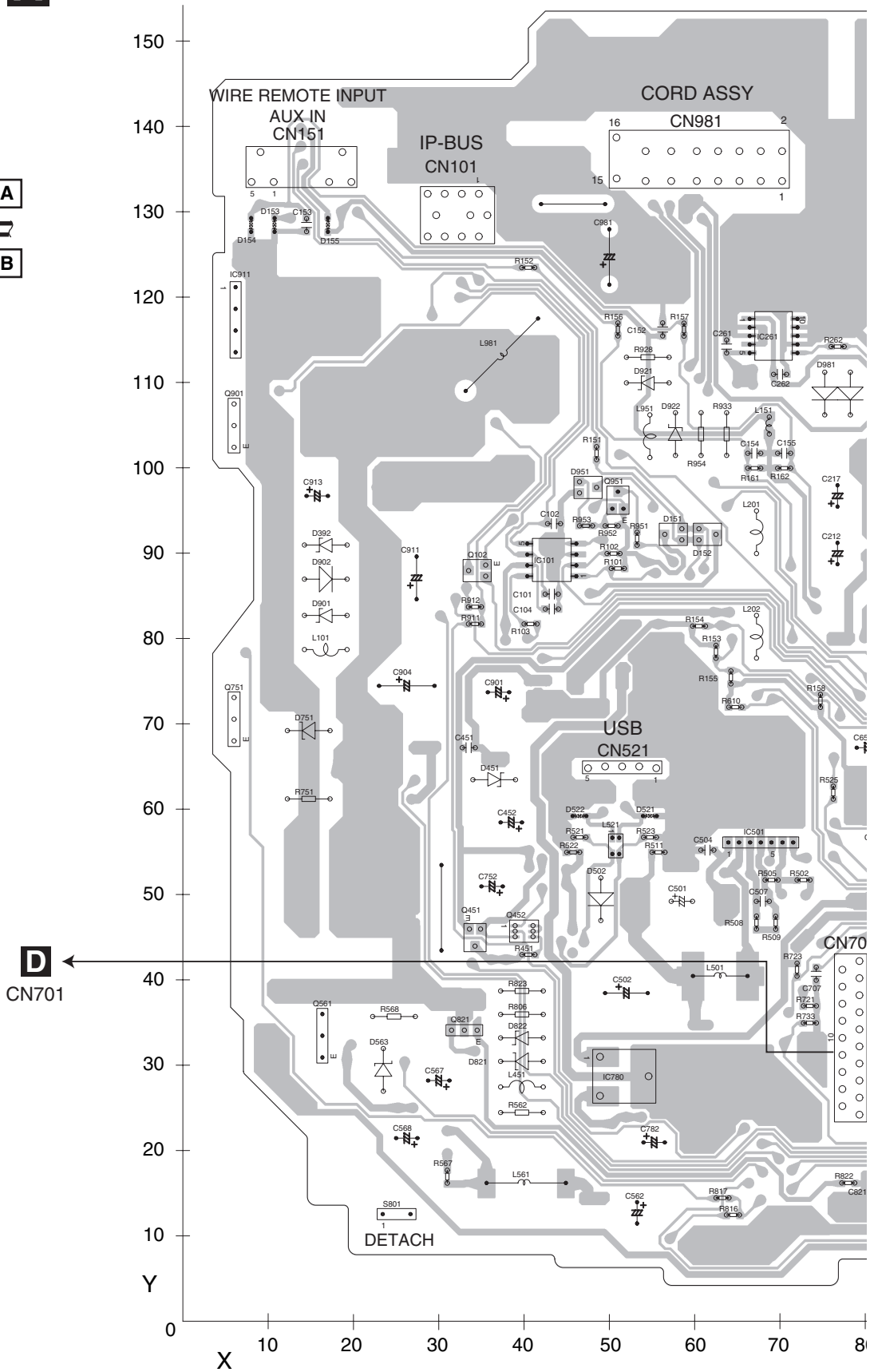
11. PCB CONNECTION DIAGRAM
11.1 TUNER AMP UNIT

NOTE FOR PCB DIAGRAMS

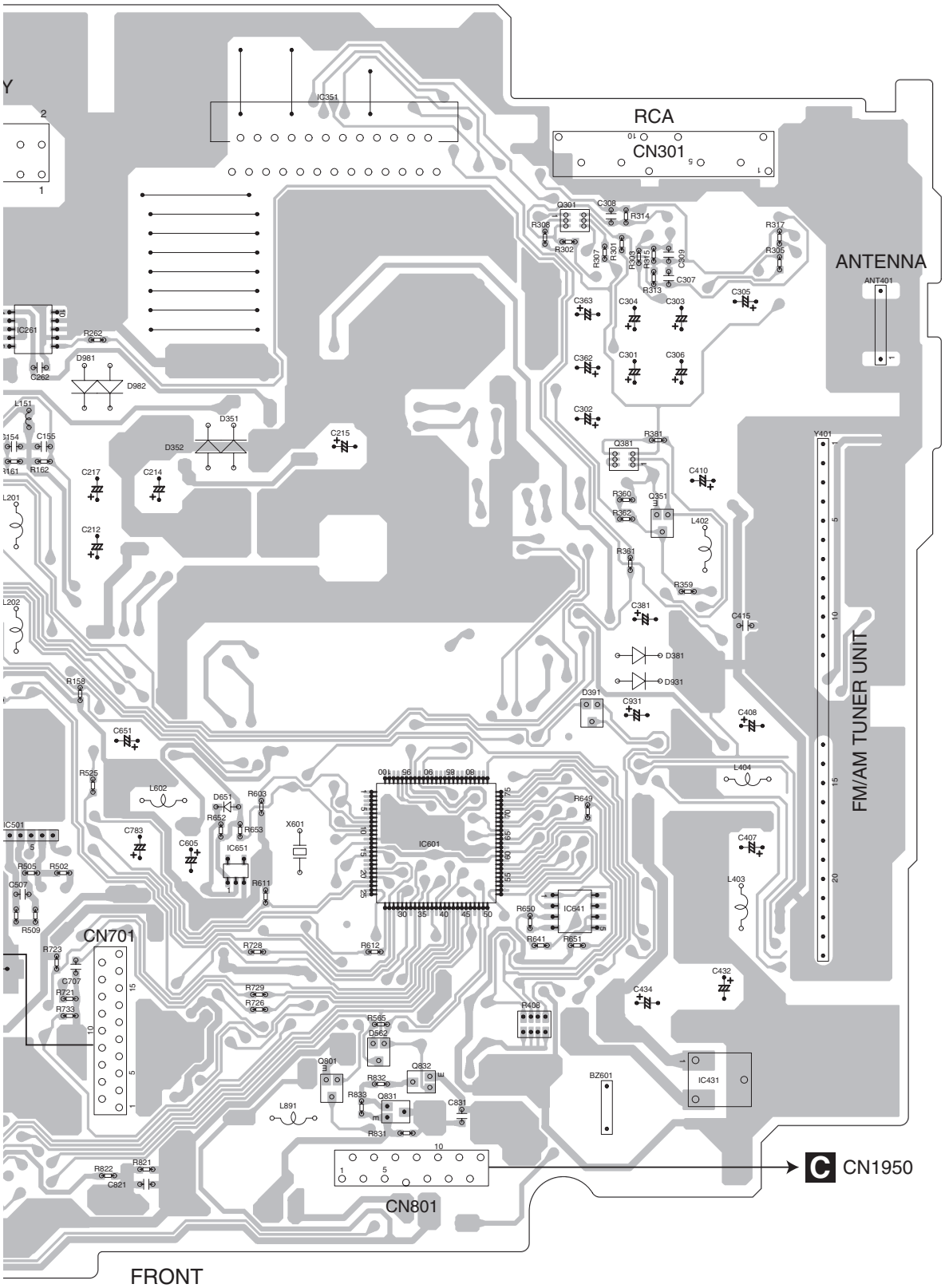
1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



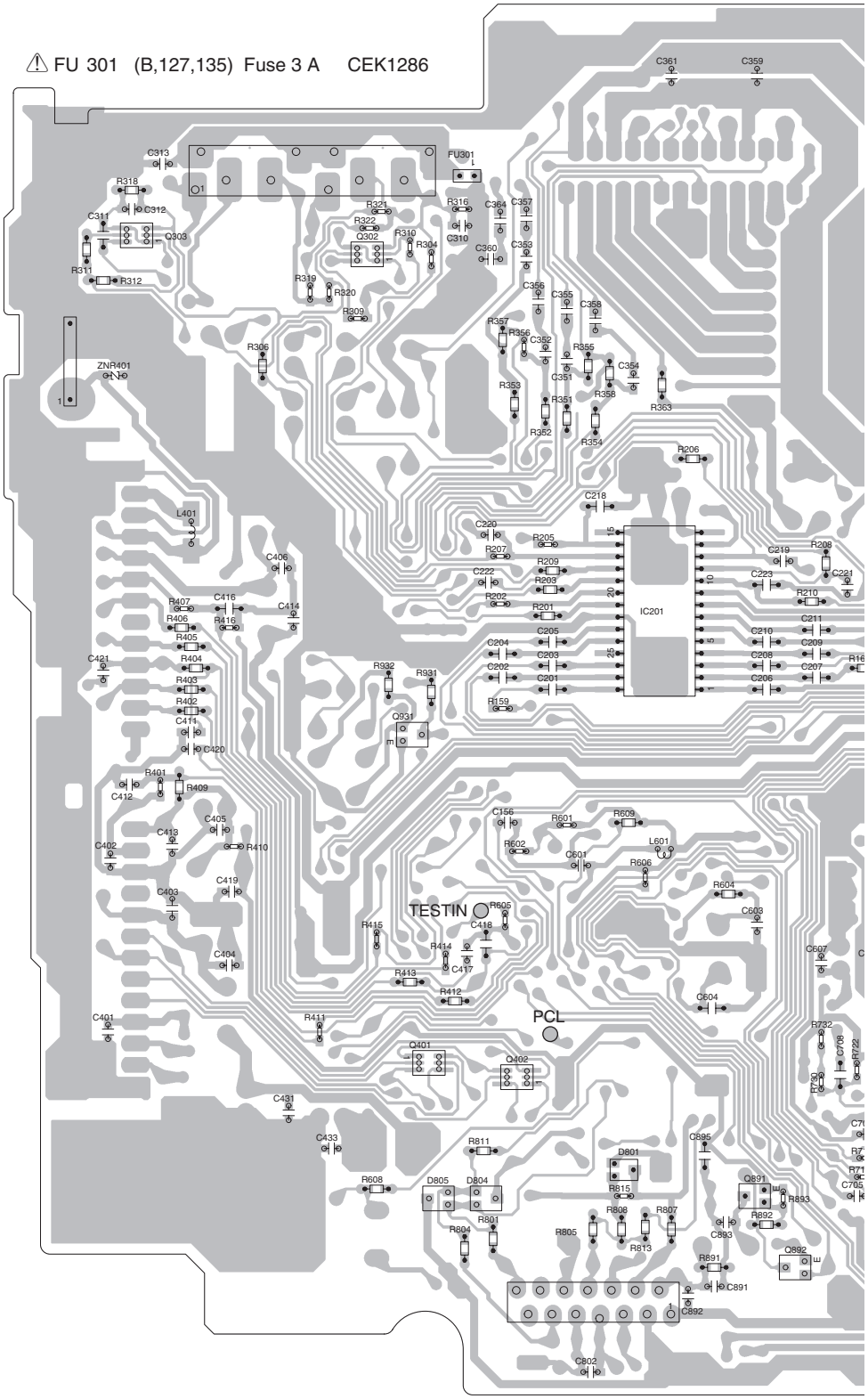
A TUNER AMP UNIT



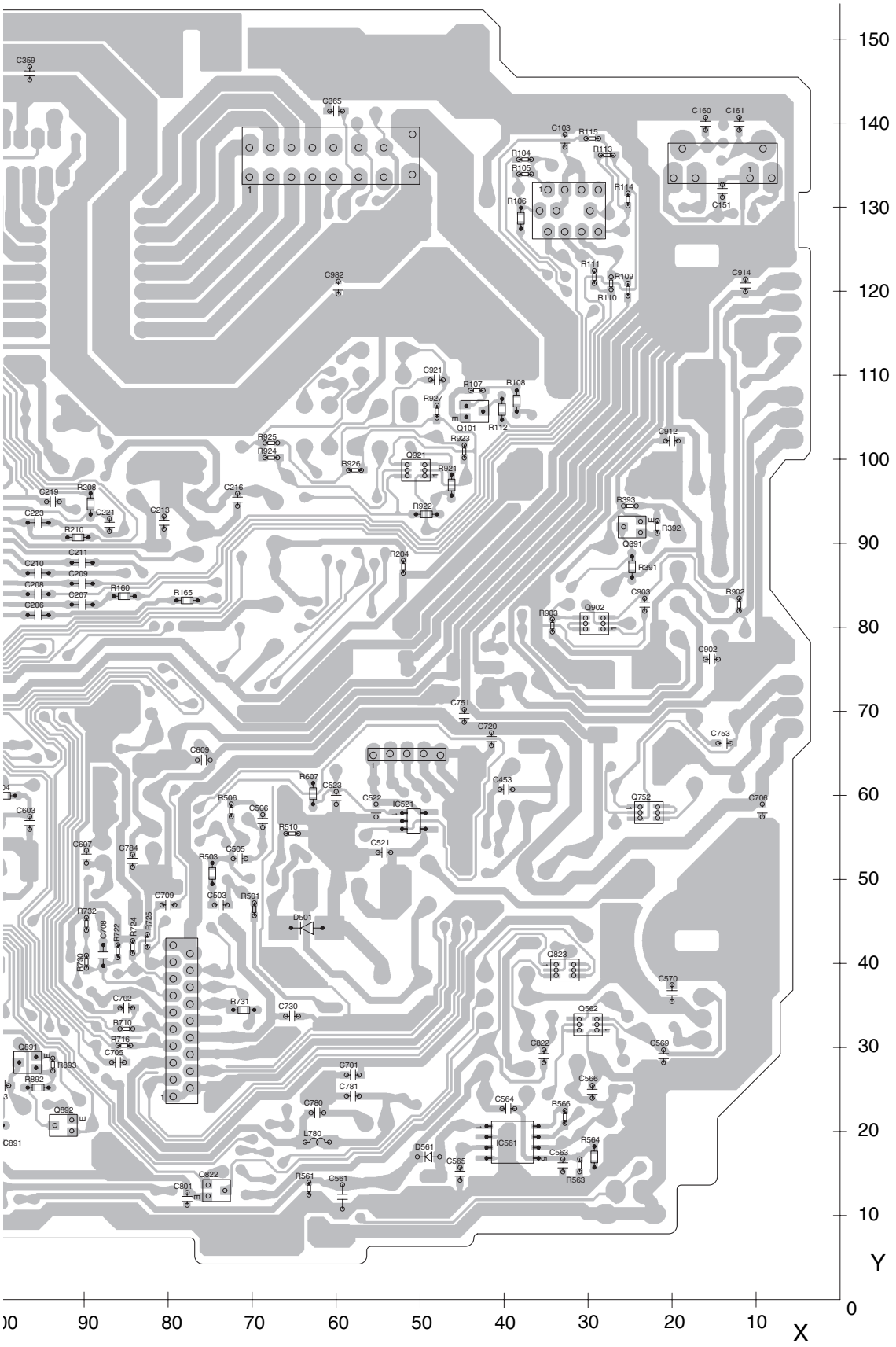
SIDE A


RCA
CN301
ANTENNA
ANT401
FM/AM TUNER UNIT
CN701
CN801
C CN1950
FRONT
IC351
IC261
IC601
IC641
IC431
IC651
IC501
X601
BZ601
Y401
70 80 90 100 110 120 130 140 150 160 170

A TUNER AMP UNIT



SIDE B

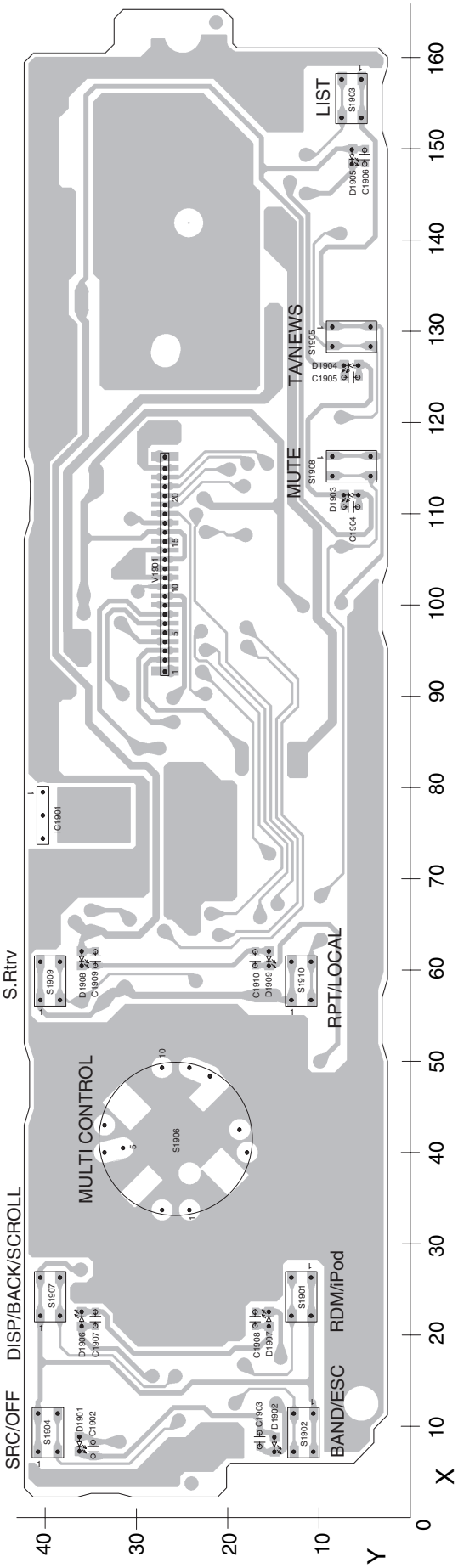


DEH-P6000UB/XN/EW5

11.2 KEYBOARD UNIT

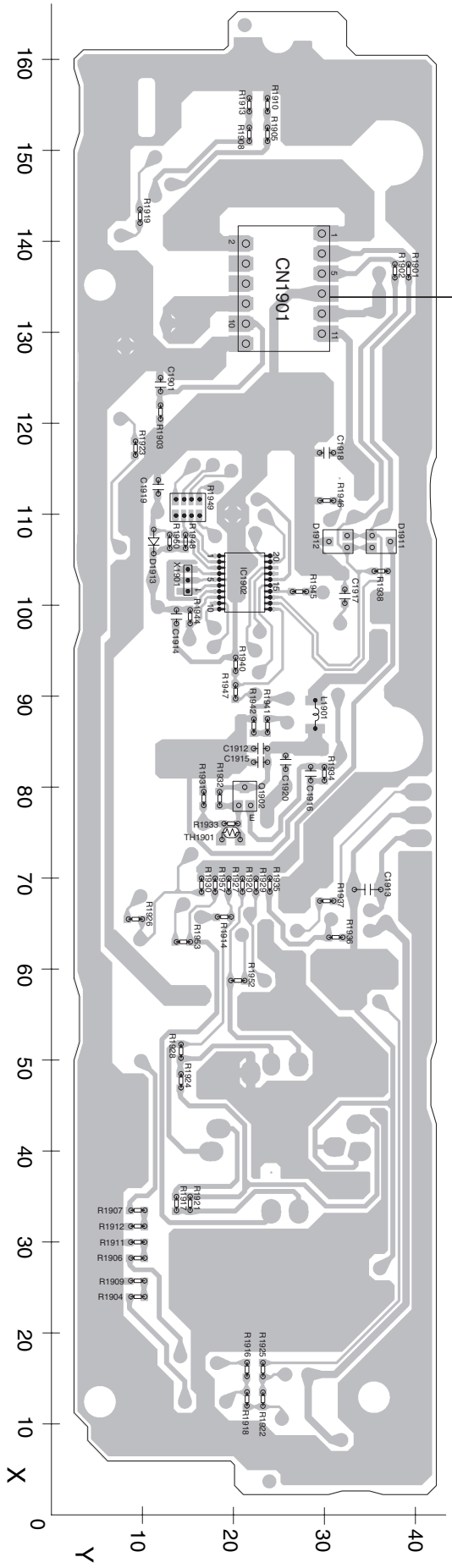
B KEYBOARD UNIT

SIDE A



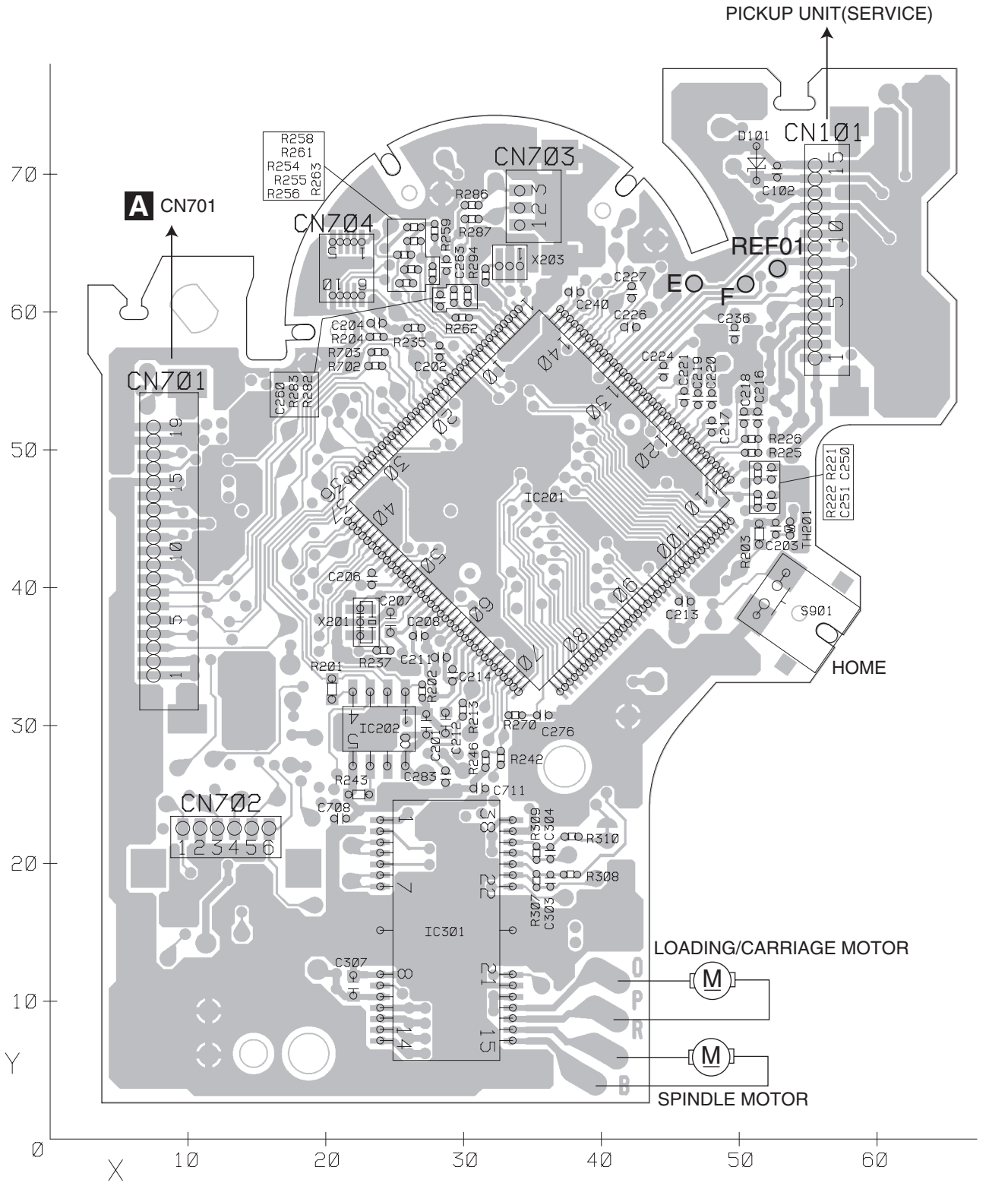
B KEYBOARD UNIT

SIDE B



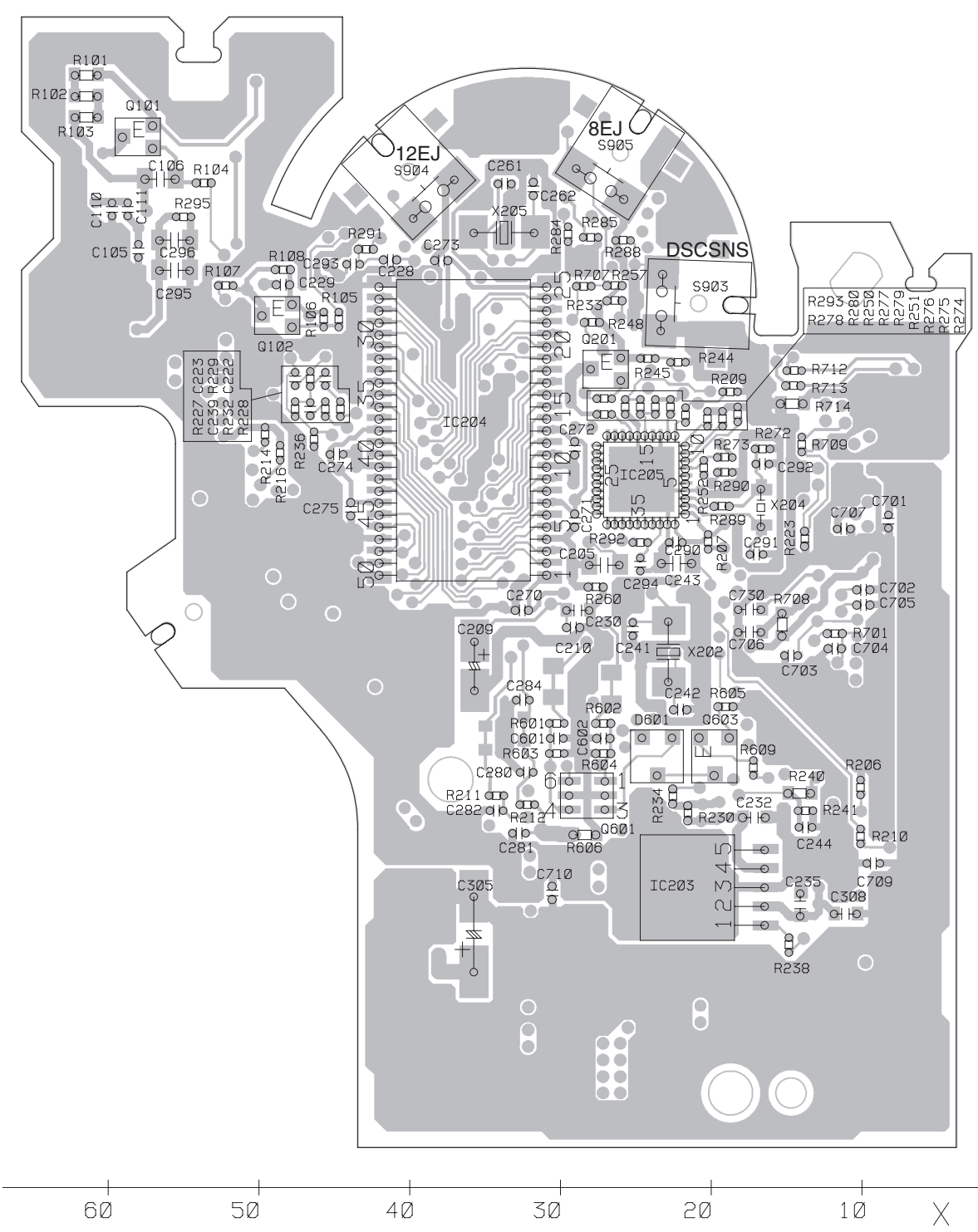
11.3 CD CORE UNIT(S10.5COMP2-iPod)

D CD CORE UNIT(S10.5COMP2-iPod) **SIDE A**



D CD CORE UNIT(10.5COMP2-iPod)

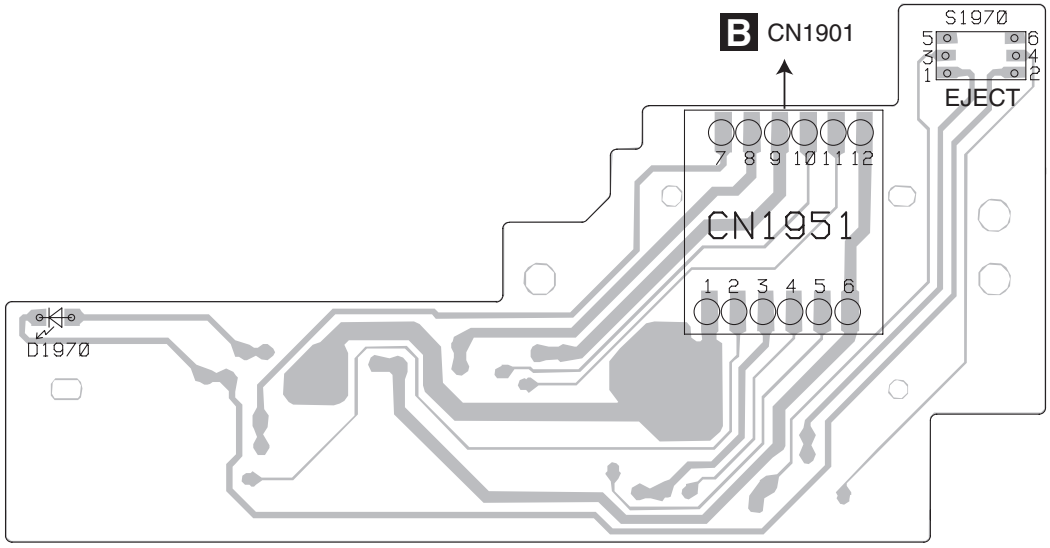
SIDE B



11.4 PANEL UNIT

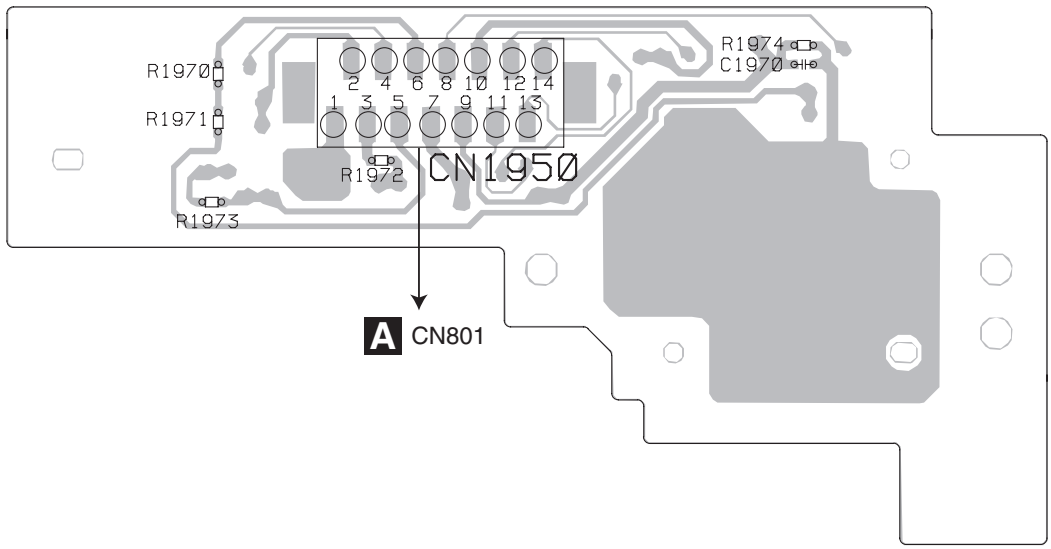
C PANEL UNIT

SIDE A



C PANEL UNIT

SIDE B



C

12. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

  Chip Resistor

  RS1/◯S◯◯◯J,RS1/◯◯S◯◯◯J

  Chip Capacitor (except for CQS.....)

  CKS....., CCS....., CSZS.....
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Meaning of the figures and others in the parentheses in the parts list.*

Example) IC 301 is on the point (face A, 91 of x-axis, and 111 of y-axis) of the corresponding PC board.

IC 301 (A, 91, 111) IC NJM2068V

Unit Number : QWM3010
Unit Name : Tuner Amp Unit
Unit Number :
Unit Name : Keyboard Unit
Unit Number : CWM8758
Unit Name : Panel Unit
Unit Number : CWX3526
Unit Name : CD Core Unit(S10.5COMP2-iPod)

A

Unit Number : QWM3010
Unit Name : Tuner Amp Unit

MISCELLANEOUS

Circuit Symbol and No.		Part No.
IC 101	(A,43,89) IC	HA12241FP
IC 201	(B,107,90) IC	PML018A
IC 351	(A,105,140) IC	PAL007C
IC 431	(A,152,27) IC	NJM2885DL1-33
IC 501	(A,68,61) Regulator IC	BD9781HFP
IC 521	(B,51,57) IC	R5523N001B
IC 561	(B,39,19) IC	NJM2360M
IC 601	(A,117,55) IC	PEG402A8
IC 651	(A,93,52) IC	S-80835CNMC-B8U
IC 780	(A,54,29) IC	NJM2885DL1-33
IC 911	(A,6,121) IC	NJM2388F84
Q 101	(B,44,106) Transistor	2SA1576A
Q 102	(A,35,88) Chip Transistor	DTC114EUA
Q 302	(B,138,127) Transistor	RT3C99M
Q 303	(B,162,129) Transistor	RT3C99M
Q 351	(A,143,93) Chip Transistor	DTC124EUA
Q 381	(A,139,100) Transistor	RT3T22M
Q 391	(B,25,92) Transistor	2SC4081
Q 401	(B,131,42) Transistor	UMH1N
Q 402	(B,122,41) Transistor	UMH1N
Q 561	(A,16,33) Transistor	2SD1858
Q 562	(B,30,33) Transistor	RT3T22M
Q 751	(A,7,71) Transistor	2SD2396
Q 752	(B,23,58) Transistor	RT3T22M
Q 801	(A,104,26) Transistor	RT1N431M
Q 821	(A,33,36) Transistor	2SD1767
Q 822	(B,74,13) Chip Transistor	DTC114EUA
Q 823	(B,33,39) Transistor	RT3T22M
Q 891	(B,97,28) Transistor	2SA1576A
Q 892	(B,93,21) Chip Transistor	DTC114EUA
Q 901	(A,7,105) Transistor	2SD2396
Q 902	(B,29,80) Transistor	RT3T22M
Q 921	(B,51,99) Transistor	RT3CLLM
Q 931	(B,133,77) Chip Transistor	DTC114EUA
Q 951	(A,51,96) Transistor	2SA1576A
D 153	(A,11,128) Diode	MALS068X
D 154	(A,8,128) Diode	MALS068X
D 155	(A,17,128) Diode	MALS068X
D 351	(A,93,102) Diode	1SR139-400
D 352	(A,90,102) Diode	1SR139-400
D 381	(A,140,77) Diode	1SS133
D 391	(A,135,70) Diode	MC2848-11
D 392	(A,17,91) Diode	HZS9L(A2)
D 501	(B,64,44) Diode	RB060L-40
D 502	(A,49,49) Diode	1SR139-400
D 521	(A,55,59) Diode	MALS068X
D 522	(A,47,59) Diode	MALS068X
D 561	(B,49,17) Diode	RB551V-30
D 563	(A,24,29) Diode	MTZJA10(B)
D 751	(A,15,69) Diode	MTZJA8R2(B)
D 801	(B,111,31) Diode	MC2850-11
D 804	(B,125,28) Diode	MC2848-11
D 805	(B,130,28) Diode	MC2846-11
D 821	(A,40,30) Diode	MTZJA10(B)
D 822	(A,40,33) Diode	HZS7L(A3)
D 901	(A,17,83) Diode	HZS6L(B1)
D 902	(A,17,87) Diode	1SR139-400
D 921	(A,55,110) Diode	HZS7L(A1)
D 922	(A,58,104) Diode	HZS7L(C3)
D 931	(A,140,74) Diode	1SS133
D 951	(A,48,98) Diode	MC2848-11
D 981	(A,75,109) Diode	1SR139-400

Circuit Symbol and No.		Part No.
D 982	(A,78,109) Diode	1SR139-400
ZNR401	(B,164,114) Surge Protector	IMSA-6801-01Y901
L 101	(A,17,79) Inductor	LAU2R2K
L 201	(A,67,92) Ferri-Inductor	LAU4R7K
L 202	(A,67,80) Ferri-Inductor	LAU100K
L 401	(B,156,98) Chip Coil	LCTAW4R7J2520
L 402	(A,148,90) Inductor	LAU1R0K
L 403	(A,152,48) Inductor	LAU1R0K
L 501	(A,63,40) Inductor	CTH1385
L 521	(A,51,56) Inductor	CTF1713
L 561	(A,40,16) Inductor	CTF1660
L 602	(A,85,60) Ferri-Inductor	LAU100K
L 891	(A,100,23) Ferri-Inductor	LAU100K
L 951	(A,55,104) Inductor	LAU2R2K
L 981	(A,32,108) Choke Coil 600 µH	CTH1280
X 601	(A,101,54) Crystal Resonator 15.000 MHz	CSS1653
S 801	(A,25,10) Switch(DETACH)	CSN1039
⚠FU301	(B,127,135) Fuse 3 A	CEK1286
BZ601	(A,137,24) Buzzer	CPV1062
ANT401	(A,169,127) Antenna Jack	CKX1056
⚠	Fuse 10 A	YEK5001

RESISTORS

R 101	(A,51,88)	RS1/16S472J
R 102	(A,51,90)	RS1/16S472J
R 103	(A,41,82)	RS1/16S102J
R 104	(B,38,136)	RS1/16S101J
R 105	(B,38,134)	RS1/16S620J
R 106	(B,38,129)	RS1/16S101J
R 107	(B,43,108)	RS1/16S223J
R 108	(B,39,107)	RS1/16S472J
R 109	(B,25,120)	RS1/16S102J
R 110	(B,27,121)	RS1/16S223J
R 111	(B,29,122)	RS1/16S181J
R 112	(B,40,106)	RS1/16S222J
R 113	(B,28,136)	RS1/16S181J
R 114	(B,25,131)	RS1/16S223J
R 115	(B,30,138)	RS1/16S102J
R 151	(A,49,102)	RS1/16S102J
R 152	(A,41,123)	RS1/16S102J
R 153	(A,63,78)	RS1/16S103J
R 154	(A,61,81)	RS1/16S103J
R 159	(B,123,79)	RS1/16S101J
R 160	(B,85,84)	RS1/16S101J
R 161	(A,67,100)	RS1/16S223J
R 162	(A,71,100)	RS1/16S223J
R 165	(B,78,83)	RS1/16S102J
R 201	(B,119,89)	RS1/16S102J
R 202	(B,124,90)	RS1/16S102J
R 203	(B,118,92)	RS1/16S102J
R 204	(B,52,87)	RS1/16S0R0J
R 205	(B,119,97)	RS1/16S101J
R 206	(B,103,106)	RS1/16S101J
R 207	(B,124,95)	RS1/16S101J
R 208	(B,89,95)	RS1/16S101J
R 209	(B,118,94)	RS1/16S101J
R 210	(B,91,91)	RS1/16S101J
R 303	(A,140,124)	RS1/16S821J
R 304	(B,131,127)	RS1/16S821J
R 305	(A,157,123)	RS1/16S821J
R 306	(B,149,115)	RS1/16S821J
R 309	(B,139,120)	RS1/16S472J
R 310	(B,133,128)	RS1/16S472J
R 311	(B,167,128)	RS1/16S472J
R 312	(B,165,124)	RS1/16S472J
R 315	(A,142,124)	RS1/16S223J
R 316	(B,128,132)	RS1/16S223J
R 317	(A,157,126)	RS1/16S223J
R 318	(B,162,134)	RS1/16S223J
R 320	(B,142,123)	RS1/16S0R0J
R 321	(B,136,132)	RS1/16S0R0J
R 351	(B,117,110)	RS1/16S0R0J
R 352	(B,119,111)	RS1/16S0R0J
R 353	(B,122,111)	RS1/16S0R0J
R 354	(B,114,110)	RS1/16S0R0J
R 359	(A,146,85)	RS1/16S103J
R 360	(A,139,95)	RS1/16S103J
R 361	(A,139,88)	RS1/16S153J
R 362	(A,139,93)	RS1/16S331J
R 363	(B,107,113)	RS1/16S0R0J
R 381	(A,143,102)	RS1/16S102J
R 391	(B,25,87)	RS1/16S223J
R 392	(B,22,92)	RS1/16S683J
R 393	(B,25,94)	RS1/16S683J
R 401	(B,159,71)	RS1/16S681J
R 402	(B,156,79)	RS1/16S681J
R 403	(B,156,81)	RS1/16S681J
R 404	(B,156,84)	RS1/16S681J
R 405	(B,156,86)	RS1/16S681J
R 406	(B,157,88)	RS1/16S681J
R 407	(B,157,90)	RS1/16S681J
R 408	(A,128,34)	RAB4C223J
R 410	(B,152,65)	RS1/16S0R0J
R 411	(B,143,45)	RS1/16S681J
R 412	(B,128,49)	RS1/16S681J
R 413	(B,133,51)	RS1/16S681J
R 502	(A,73,52)	RS1/16S3302F
R 503	(B,75,51)	RS1/16S333J
R 505	(A,69,52)	RS1/16S8201F
R 506	(B,73,58)	RS1/16S683J
R 508	(A,67,47)	RS1/16S8202D
R 509	(A,70,47)	RS1/16S6801F
R 511	(A,56,55)	RS1/10SR471J
R 525	(A,76,62)	RS1/16S103J
R 562	(A,40,24)	RD1/4PU472J
R 563	(B,31,16)	RS1/16S102J
R 564	(B,29,17)	RS1/16S821J
R 565	(A,110,34)	RS1/16S0R0J
R 566	(B,33,22)	RS1/10SR821J
R 567	(A,31,17)	RS1/16S1R0J
R 568	(A,25,36)	RD1/4PU681J
R 603	(A,96,59)	RS1/16S0R0J
R 604	(B,100,60)	RS1/16S0R0J
R 605	(B,123,57)	RS1/16S104J
R 606	(B,108,62)	RS1/16S473J
R 607	(B,63,60)	RS1/16S681J
R 608	(B,137,29)	RS1/16S102J
R 610	(A,65,72)	RS1/16S104J
R 611	(A,97,49)	RS1/16S104J

Circuit Symbol and No.		Part No.
R 612	(A,109,42)	RS1/16S222J
R 641	(A,129,43)	RS1/16S104J
R 652	(A,91,57)	RS1/16S822J
R 653	(A,94,57)	RS1/16S102J
R 710	(B,85,32)	RS1/16S102J
R 716	(B,85,30)	RS1/16S102J
R 721	(A,74,37)	RS1/16S104J
R 722	(B,86,41)	RS1/16S472J
R 723	(A,72,41)	RS1/16S104J
R 724	(B,84,42)	RS1/16S472J
R 725	(B,83,43)	RS1/16S104J
R 726	(A,96,36)	RS1/16S221J
R 728	(A,96,42)	RS1/16S221J
R 729	(A,96,37)	RS1/16S221J
R 730	(B,90,40)	RS1/16S221J
R 731	(B,71,34)	RS1/16S221J
R 733	(A,74,35)	RS1/16S104J
R 751	(A,15,61)	RD1/4PU561J
R 801	(B,124,24)	RS1/16S222J
R 804	(B,127,23)	RS1/16S222J
R 805	(B,114,25)	RS1/16S222J
R 806	(A,40,36)	RD1/4PU391J
R 807	(B,106,25)	RS1/16S222J
R 808	(B,111,25)	RS1/16S473J
R 811	(B,125,33)	RS1/16S102J
R 813	(B,108,25)	RS1/16S222J
R 815	(B,111,28)	RS1/16S473J
R 816	(A,65,12)	RS1/16S102J
R 817	(A,63,14)	RS1/16S104J
R 821	(A,83,17)	RS1/16S472J
R 822	(A,78,16)	RS1/16S1R0J
R 823	(A,40,39)	RD1/4PU471J
R 831	(A,113,21)	RS1/16S0R0J
R 891	(B,101,21)	RS1/16S222J
R 892	(B,96,25)	RS1/16S102J
R 893	(B,94,28)	RS1/16S473J
R 902	(B,12,83)	RS1/16S822J
R 903	(B,34,80)	RS1/16S222J
R 911	(A,34,82)	RS1/16S102J
R 912	(A,34,84)	RS1/16S103J
R 921	(B,46,97)	RS1/16S104J
R 922	(B,49,93)	RS1/16S104J
R 923	(B,45,101)	RS1/16S104J
R 924	(B,68,100)	RS1/16S103J
R 925	(B,68,102)	RS1/16S473J
R 926	(B,58,99)	RS1/16S473J
R 927	(B,48,106)	RS1/16S472J
R 928	(A,55,113)	RD1/4PU102J
R 931	(B,131,81)	RS1/16S104J
R 932	(B,135,82)	RS1/16S103J
R 933	(A,64,104)	RD1/4PU102J
R 951	(A,53,92)	RS1/16S102J
R 952	(A,50,93)	RS1/16S472J
R 954	(A,61,104)	RD1/4PU153J

CAPACITORS

C 101	(A,43,85)	CCSRCH101J50
C 102	(A,44,93)	CCSRCH101J50
C 103	(B,33,138)	CKSRYB104K16
C 104	(A,43,83)	CKSRYB104K16
C 152	(A,56,116)	CKSRYB104K16
C 154	(A,67,102)	CKSRYB472K50
C 155	(A,71,102)	CKSRYB472K50
C 160	(B,16,140)	CKSRYB103K50
C 161	(B,12,140)	CKSRYB103K50
C 201	(B,118,81)	CKSRYB105K10
C 202	(B,123,83)	CKSRYB105K10
C 203	(B,118,84)	CKSRYB105K10
C 204	(B,123,85)	CKSRYB224K16
C 205	(B,118,86)	CKSRYB105K10
C 206	(B,96,81)	CKSRYB105K10
C 207	(B,90,83)	CKSRYB105K10
C 208	(B,96,84)	CKSRYB105K10
C 209	(B,90,85)	CKSRYB105K10
C 210	(B,96,86)	CKSRYB224K16
C 211	(B,90,88)	CKSRYB105K10
C 212	(A,77,90)	CEJQ100M25
C 213	(B,81,92)	CKSRYB104K16
C 214	(A,84,97)	CEJQ470M16
C 215	(A,106,102)	CEJQ100M25
C 216	(B,72,95)	CKSRYB104K16
C 217	(A,77,97)	CEJQ470M16
C 303	(A,145,117)	CEJQ4R7M35
C 304	(A,140,117)	CEJQ4R7M35
C 305	(A,153,119)	CEJQ4R7M35
C 306	(A,145,110)	CEJQ4R7M35
C 351	(B,117,116)	CKSRYB474K10
C 352	(B,119,117)	CKSRYB474K10
C 353	(B,121,127)	CKSRYB474K10
C 354	(B,110,114)	CKSRYB474K10
C 355	(B,117,121)	CKSQYB474K25
C 356	(B,120,122)	CKSQYB474K25
C 357	(B,121,131)	CKSQYB474K25
C 358	(B,114,120)	CKSQYB474K25
C 360	(B,125,127)	CKSQYB225K10
C 361	(B,106,146)	CKSRYB104K16
C 362	(A,134,111)	CEJQ100M25
C 363	(A,134,117)	CEJQ330M10
C 364	(B,124,131)	CKSQYB225K10
C 381	(A,141,81)	CEJQ220M16
C 403	(B,158,58)	CKSQYB475K10
C 404	(B,152,52)	CKSRYB103K50
C 405	(B,153,67)	CKSRYB103K50
C 406	(B,147,94)	CKSRYB103K50
C 407	(A,154,55)	CEJQ470M6R3
C 408	(A,154,72)	CEJQ470M10
C 410	(A,148,98)	CEJQ101M16
C 413	(B,158,65)	CKSRYB223K50
C 417	(B,127,54)	CCSRCH470J50
C 420	(B,156,75)	CCSRCH101J50
C 432	(A,150,38)	CEJQ470M6R3
C 434	(A,141,36)	CEJQ1R0M50
C 501	(A,59,49) 150 µF/6.3 V	CCH1781
C 502	(A,52,38)	CEJQ221M16
C 503	(B,74,47)	CCSRCH221J50
C 504	(A,62,55)	CKSRYB105K16
C 506	(B,69,57)	CKSRYB103K50
C 507	(A,68,49)	CKSRYB104K16
C 521	(B,54,53)	CKSRYB104K16
C 522	(B,55,58)	CKSRYB104K16

Circuit Symbol and No.			Part No.
C 523	(B,60,60)		CKSRYB103K50
C 562	(A,53,13)		CEJQ470M25
C 564	(B,40,23)		CKSRYB223K50
C 565	(B,45,15)		CCSRCH331J50
C 566	(B,30,25)		CKSRYB104K16
C 567	(A,30,28)		CEJQ101M16
C 568	(A,26,21)		CEJQ470M16
C 569	(B,21,29)		CKSRYB104K16
C 601	(B,115,63)		CCSRCH101J50
C 603	(B,97,57)		CCSRCH220J50
C 604	(B,101,48)		CCSRCH180J50
C 605	(A,88,53)		CEJQ4R7M35
C 607	(B,90,53)		CKSRYB105K10
C 609	(B,76,64)		CKSRYB105K10
C 651	(A,80,67)		CEJQ2R2M50
C 702	(B,85,35)		CKSRYB152K50
C 705	(B,86,28)		CKSRYB152K50
C 720	(B,42,67)		CKSRYB105K16
C 751	(B,45,69)		CKSRYB104K16
C 752	(A,36,51)		CEJQ101M16
C 753	(B,14,66)		CKSRYB473K50
C 781	(B,58,24)		CKSRYB103K50
C 782	(A,55,21)		CEJQ470M6R3
C 783	(A,82,55)		CEJQ4R7M35
C 784	(B,84,52)		CKSRYB105K10
C 822	(B,35,29)		CKSRYB472K50
C 893	(B,100,25)		CKSRYB105K10
C 901	(A,37,74)		CEJQ470M16
C 902	(B,15,76)		CKSRYB103K50
C 903	(B,23,83)		CKSRYB472K50
C 904	(A,26,74)		CEAT102M16
C 911	(A,27,87)		CEJQ221M16
C 912	(B,20,102)		CKSRYB103K50
C 913	(A,16,97)		CEJQ101M16
C 914	(B,11,121)		CKSRYB103K50
C 921	(B,48,109)		CKSRYB104K16
C 931	(A,140,70)		CEJQ1R0M50
C 981	(A,50,125)	3 300 µF/16 V	CCH1486
C 982	(B,60,120)		CKSRYB104K16

B

Unit Number :
Unit Name : Keyboard Unit

MISCELLANEOUS

IC 1901	(A,77,35)	Remote IC	GP1UX51RK
IC 1902	(B,103,22)	IC	PEG411A
Q 1902	(B,79,22)	Transistor	2SC4081
D 1901	(A,8,37)	LED	CL-197HB1-D(CDE)
D 1902	(A,8,15)	LED	CL-197HB1-D(CDE)
D 1903	(A,112,7)	LED	CL-197HB1-D(CDE)
D 1904	(A,126,7)	LED	CL-197HB1-D(CDE)
D 1905	(A,149,7)	LED	CL-197HB1-D(CDE)
D 1906	(A,22,36)	LED	CL-197HB1-D(CDE)
D 1907	(A,22,16)	LED	CL-197HB1-D(CDE)
D 1908	(A,61,36)	LED	CL-197HB1-D(CDE)
D 1909	(A,61,16)	LED	CL-197HB1-D(CDE)
D 1913	(B,107,12)	Diode	1SS355
L 1901	(B,88,29)	Inductor	CTF1617

Circuit Symbol and No.			Part No.
X 1901	(B,103,15)	Radiator 10.0 MHz	CSS1577
S 1901	(A,24,12)	Push Switch	CSG1155
S 1902	(A,9,12)	Push Switch	CSG1155
S 1903	(A,156,7)	Push Switch	CSG1155
S 1904	(A,9,40)	Push Switch	CSG1155
S 1905	(A,129,7)	Push Switch	CSG1155
S 1906	(A,40,25)	Switch(MULTI-CONTROL)	CSX1120
S 1907	(A,24,40)	Push Switch	CSG1155
S 1908	(A,115,7)	Push Switch	CSG1155
S 1909	(A,59,40)	Push Switch	CSG1155
S 1910	(A,59,12)	Push Switch	CSG1155

RESISTORS

R 1901	(B,137,40)	RS1/16S222J
R 1902	(B,137,38)	RS1/16S222J
R 1903	(B,121,12)	RS1/16S473J
R 1904	(B,24,10)	RS1/16S181J
R 1905	(B,152,24)	RS1/16S181J
R 1906	(B,28,10)	RS1/16S181J
R 1907	(B,34,10)	RS1/16S181J
R 1908	(B,152,22)	RS1/16S391J
R 1909	(B,26,10)	RS1/16S221J
R 1910	(B,155,24)	RS1/16S221J
R 1911	(B,30,10)	RS1/16S221J
R 1912	(B,32,10)	RS1/16S221J
R 1913	(B,155,22)	RS1/16S391J
R 1914	(B,66,19)	RS1/16S102J
R 1916	(B,16,22)	RS1/16S333J
R 1917	(B,34,14)	RS1/16S333J
R 1918	(B,13,22)	RS1/16S822J
R 1919	(B,143,10)	RS1/16S822J
R 1920	(B,69,21)	RS1/16S103J
R 1921	(B,34,16)	RS1/16S822J
R 1922	(B,13,24)	RS1/16S332J
R 1923	(B,117,10)	RS1/16S332J
R 1924	(B,48,15)	RS1/16S332J
R 1925	(B,16,24)	RS1/16S222J
R 1926	(B,66,10)	RS1/16S222J
R 1927	(B,69,20)	RS1/16S103J
R 1928	(B,51,15)	RS1/16S222J
R 1929	(B,69,23)	RS1/16S103J
R 1930	(B,69,17)	RS1/16S103J
R 1931	(B,79,17)	RS1/16S682J
R 1932	(B,79,19)	RS1/16S3902F
R 1933	(B,76,20)	RS1/16S6802F
R 1934	(B,82,30)	RS1/16S392J
R 1935	(B,69,24)	RS1/16S101J
R 1936	(B,64,32)	RS1/16S103J
R 1937	(B,68,31)	RS1/16S2R2J
R 1938	(B,104,37)	RS1/16S103J
R 1940	(B,94,21)	RS1/16S473J
R 1941	(B,87,24)	RS1/16S2202D
R 1942	(B,87,23)	RS1/16S3002D
R 1944	(B,99,16)	RS1/16S473J
R 1945	(B,102,28)	RS1/16S101J
R 1946	(B,112,31)	RS1/16S102J
R 1947	(B,91,21)	RS1/16S101J
R 1948	(B,107,15)	RS1/16S473J
R 1949	(B,111,15)	RAB4C101J

Circuit Symbol and No.		Part No.
R 1950	(B,107,13)	RS1/16S154J
R 1952	(B,59,21)	RS1/16S102J
R 1953	(B,63,15)	RS1/16S102J
R 1957	(B,69,18)	RS1/16S103J

CAPACITORS

C 1902	(A,8,35)	CKSRYB104K16
C 1903	(A,9,17)	CKSRYB104K16
C 1904	(A,111,7)	CKSRYB104K16
C 1905	(A,125,7)	CKSRYB104K16
C 1906	(A,149,5)	CKSRYB104K16
C 1907	(A,22,35)	CKSRYB104K16
C 1908	(A,22,17)	CKSRYB104K16
C 1909	(A,61,35)	CKSRYB104K16
C 1910	(A,61,17)	CKSRYB104K16
C 1913	(B,69,35)	CKSYF106Z10
C 1914	(B,99,14)	CKSRYB103K50
C 1915	(B,83,23)	CKSRYB104K16
C 1916	(B,82,29)	CKSRYB104K16
C 1917	(B,101,33)	CKSRYB224K16
C 1918	(B,117,31)	CKSRYB105K10
C 1919	(B,113,12)	CKSRYB104K16
C 1920	(B,83,26)	CKSRYB103K50

C

Unit Number : CWM8758
Unit Name : Panel Unit

MISCELLANEOUS

D 1970	LED	CL220PGC
S 1970	Push Switch(EJECT)	CSG1112

RESISTORS

R 1970		RS1/16S101J
R 1971		RS1/16S101J
R 1972		RS1/16S0R0J

CAPACITORS

C 1970		CKSRYB104K16

D

Unit Number : CWX3526
Unit Name : CD Core Unit(S10.5COMP2-iPod)

MISCELLANEOUS

IC 201	(A,36,46)	IC	PE5611B
IC 205	(B,25,47)	IC	341S2094
IC 301	(A,29,15)	IC	BA5839FP
Q 101	(B,58,70)	Transistor	2SA1577
Q 102	(B,49,58)	Chip Transistor	2SB1689
Q 201	(B,27,54)	Transistor	2SA1577
X 201	(A,23,38)	Ceramic Resonator 16.934 MHz	CSS1603
X 204	(B,17,45)	Oscillator 32.768 kHz	CSS1735
X 205	(B,34,63)	Oscillator 48.000 MHz	CSS1753
S 901	(A,55,37)	Switch(HOME)	CSN1067
S 903	(B,20,59)	Switch(DSCSNS)	CSN1067
S 904	(B,41,68)	Switch(12EJ)	CSN1068
S 905	(B,25,70)	Switch(8EJ)	CSN1068

RESISTORS

R 101	(B,61,74)	RS1/10SR2R4J
R 102	(B,61,72)	RS1/10SR2R4J
R 103	(B,61,71)	RS1/10SR2R7J
R 104	(B,54,67)	RS1/16SS222J
R 105	(B,45,58)	RS1/16SS102J
R 107	(B,52,60)	RS1/16SS105J
R 202	(A,27,33)	RS1/16SS473J
R 203	(A,51,44)	RS1/16S473J
R 204	(A,24,58)	RS1/16SS221J
R 206	(B,10,27)	RS1/16SS104J
R 210	(B,10,23)	RS1/16SS102J
R 214	(B,50,50)	RS1/16SS472J
R 216	(B,49,49)	RS1/16SS472J
R 221	(A,51,48)	RS1/16SS103J
R 222	(A,51,46)	RS1/16SS103J
R 223	(B,14,43)	RS1/16SS473J
R 225	(A,51,50)	RS1/16SS103J
R 226	(A,51,51)	RS1/16SS393J
R 227	(B,48,52)	RS1/16SS562J
R 228	(B,45,52)	RS1/16SS122J
R 229	(B,47,54)	RS1/16SS472J
R 230	(B,22,25)	RS1/16SS0R0J
R 232	(B,46,52)	RS1/16SS122J
R 233	(B,26,59)	RS1/16SS103J
R 234	(B,23,26)	RS1/16SS473J
R 235	(A,26,59)	RS1/16SS473J
R 237	(A,24,35)	RS1/16SS151J
R 240	(B,14,26)	RS1/16S473J
R 241	(B,14,25)	RS1/16SS103J
R 244	(B,22,55)	RS1/16SS473J
R 250	(B,25,52)	RS1/16SS101J
R 251	(B,22,51)	RS1/16SS101J
R 252	(B,21,48)	RS1/16SS101J
R 254	(A,26,64)	RS1/16SS104J
R 255	(A,26,63)	RS1/16SS104J
R 256	(A,26,62)	RS1/16SS104J
R 259	(A,28,66)	RS1/16SS0R0J
R 261	(A,26,65)	RS1/16SS104J
R 262	(A,30,60)	RS1/16SS0R0J
R 263	(A,28,63)	RS1/16SS0R0J
R 273	(B,19,48)	RS1/16SS103J
R 274	(B,18,51)	RS1/16SS104J
R 275	(B,19,51)	RS1/16SS104J
R 276	(B,20,51)	RS1/16SS104J
R 277	(B,24,52)	RS1/16SS103J
R 278	(B,27,51)	RS1/16SS1003D
R 279	(B,23,52)	RS1/16SS104J
R 282	(A,30,61)	RS1/16SS240J
R 283	(A,29,61)	RS1/16SS240J
R 284	(B,30,63)	RS1/16SS153J
R 285	(B,28,63)	RS1/16SS153J
R 289	(B,19,45)	RS1/16SS0R0J
R 291	(B,43,62)	RS1/16SS272J
R 292	(B,25,43)	RS1/16SS221J
R 293	(B,27,52)	RS1/16SS472J
R 294	(A,32,63)	RS1/16SS471J

Circuit Symbol and No.		Part No.
R 295	(B,55,64)	RS1/16SS103J
R 307	(A,35,19)	RS1/16SS183J
R 308	(A,38,19)	RS1/16SS183J
R 309	(A,35,21)	RS1/16SS183J
R 310	(A,38,22)	RS1/16SS183J
R 601	(B,30,31)	RS1/16SS0R0J
R 602	(B,27,31)	RS1/16SS0R0J
R 606	(B,28,23)	RS1/16S0R0J
R 701	(B,12,37)	RS1/16SS221J
R 702	(A,24,56)	RS1/16SS221J
R 708	(B,15,37)	RS1/16S0R0J
R 712	(B,15,54)	RS1/16SS0R0J
R 713	(B,15,53)	RS1/16SS0R0J

CAPACITORS

C 106	(B,57,67)	CKSQYB475K6R3
C 202	(A,28,57)	CKSSYB104K10
C 204	(A,24,59)	CKSSYB103K16
C 205	(B,27,41)	CKSQYB475K6R3
C 206	(A,23,41)	CKSSYB104K10
C 207	(A,25,38)	CKSRYB104K16
C 209	(B,36,35)	CEVW220M6R3
C 210	(B,29,37)	CKSSYB104K10
C 211	(A,28,35)	CKSSYB104K10
C 212	(A,29,30)	CKSRYB104K16
C 213	(A,46,39)	CKSSYB104K10
C 214	(A,29,34)	CKSSYB104K10
C 216	(A,51,52)	CKSSYB332K50
C 217	(A,48,52)	CKSSYB104K10
C 218	(A,50,52)	CKSSYB473K10
C 219	(A,47,54)	CKSSYB104K10
C 220	(A,48,54)	CKSSYB182K50
C 221	(A,46,54)	CKSSYB104K10
C 222	(B,46,54)	CCSSCH560J50
C 223	(B,48,54)	CCSSCH4R0C50
C 224	(A,45,56)	CKSSYB104K10
C 226	(A,42,59)	CCSSCH680J50
C 227	(A,42,61)	CCSSCH470J50
C 228	(B,41,62)	CKSSYB103K16
C 229	(B,48,60)	CKSSYB104K10
C 236	(A,50,58)	CKSSYB104K10
C 239	(B,47,52)	CCSSCH220J50
C 240	(A,38,61)	CKSSYB104K10
C 243	(B,22,41)	CKSQYB475K6R3
C 250	(A,52,48)	CKSSYB102K50
C 251	(A,52,46)	CKSSYB102K50
C 260	(A,28,61)	CKSSYB104K10
C 261	(B,34,67)	CCSSCH8R0D50
C 262	(B,32,66)	CCSSCH8R0D50
C 290	(B,22,43)	CKSSYB104K10
C 291	(B,17,42)	CCSSCH5R0C50
C 292	(B,17,48)	CCSSCH5R0C50
C 293	(B,44,61)	CKSSYB102K50
C 294	(B,25,41)	CKSSYB103K16
C 295	(B,56,61)	CKSQYB106K6R3
C 296	(B,56,63)	CKSQYB106K6R3
C 303	(A,36,19)	CKSSYB472K25
C 304	(A,36,21)	CKSSYB223K16
C 307	(A,22,11)	CKSRYB104K16
C 308	(B,11,18)	CKSRYB105K10

Circuit Symbol and No.		Part No.
C 703	(B,15,35)	CCSSCH101J50
C 704	(B,12,36)	CKSSYB102K50
C 711	(A,31,25)	CKSSYB104K10

Miscellaneous Parts List

	Pickup Unit(P10.5)(Service)	CXX1942
M 1	Motor Unit(SPINDLE)	CXC7134
M 2	Motor Unit(LOADING/CARRIAGE)	CXC4026

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Service Manual

ORDER NO.
CRT4050

CD MECHANISM MODULE(S10.5COMP2-iPod/USB)

CX-3240

This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.
When performing repairs use this manual together with the specific manual for model under repair.

Model	Service Manual	CD Mechanism Module
DEH-P500UB/XN/UC DEH-P5000UB/XN/UC	CRT4034	CXK5770
DEH-P5050UB/XN/ES DEH-P5050UB/XN/ES1 DEH-P5090UB/XN/ID	CRT4035	CXK5770
DEH-P6000UB/XN/EW5	CRT4036	CXK5770
DEH-P400UB/XS/UC DEH-P4000UB/XS/UC DEH-P4050UB/XS/ES DEH-P4050UB/XU/CN5	CRT4051	CXK5770
DEH-4000UB/XS/EW5 DEH-3050UB/XS/ES DEH-3050UB/XU/CN5	CRT4052	CXK5771
DEH-50UB/XS/EW5	CRT4053	CXK5770
DEH-P4050UB/XN/ES DEH-P4050UB/XN/ES1	CRT4054	CXK 5770

Model	Service Manual	CD Mechanism Module
DEH-5000UB/XS/EW5	CRT4055	CXK5771
DEH-4000UB/X1P/EW5	CRT4056	CXK5771
DEH-3050UB/XN/ES DEH-3050UB/XN/ES1 DEH-3090UB/XN/ID	CRT4059	CXK5771
DEH-P6000UB/X1PEW5	CRT4088	CXK5770
DEH-P5050UB/XU/CN5	CRT4089	CXK5770
DEH-P600UB/XN/UC DEH-P6000UB/XN/UC DEH-P6050UB/XN/ES DEH-P6050UB/XN/ES1	CRT4090	CXK5770
DEH-P7000UB/XN/EW5	CRT4091	CXK5770

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1. CIRCUIT DESCRIPTIONS

The recent mainstay of the CD LSI is the LSI integrating the core DSP with DAC or RF amplifier, which are generally employed as peripheral circuits, however, PE5611B, used in this product, is an LSI integrating the afore-mentioned LSI unit and microcomputer unit in one chip, with an additional USB host control section.

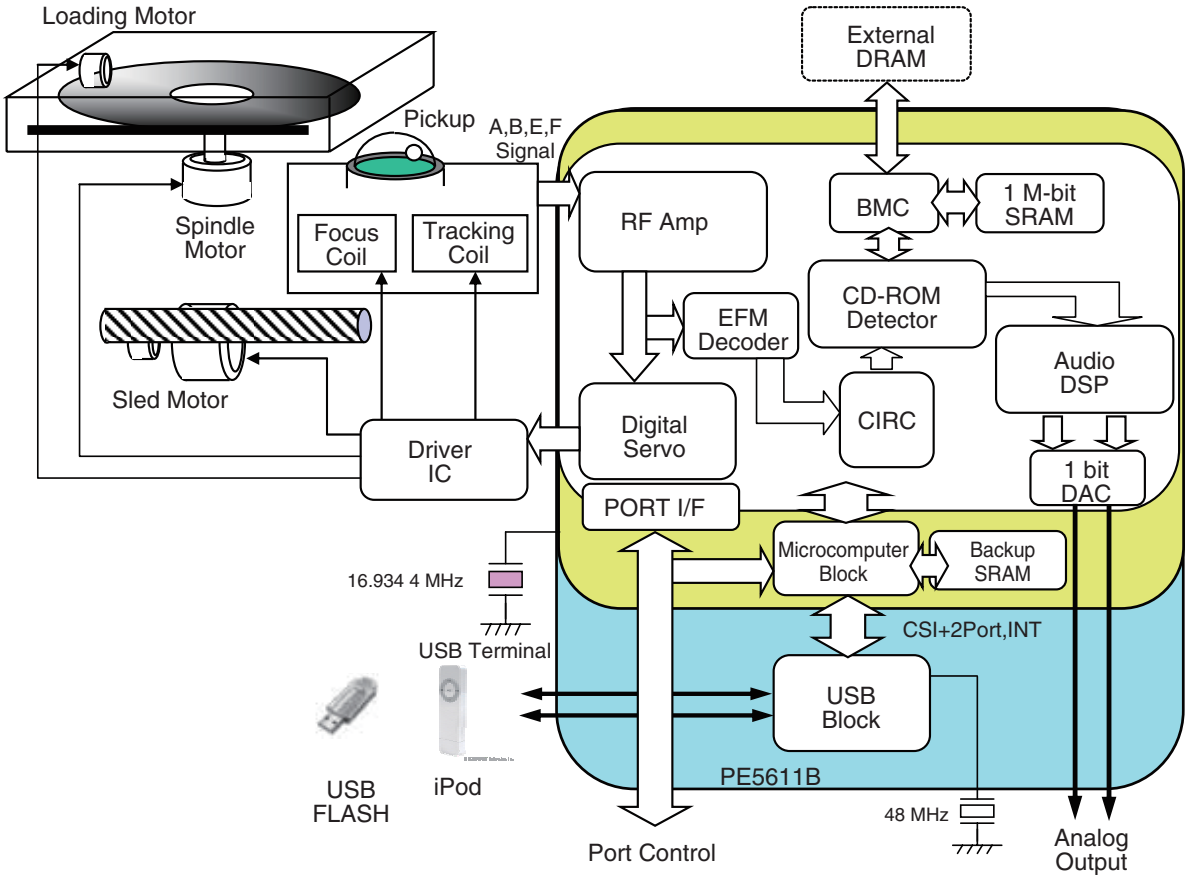


Fig.1.0.1 Block diagram of CD LSI PE5611B

1.1 PREAMPLIFIER BLOCK

In the preamplifier block, the pickup output signals are processed to generate signals that are used in the subsequent blocks: servo, demodulator, and control blocks. Signals from the pickup are I/V converted in the pickup with the preamplifier with built-in photo detectors, and after added with the RF amplifier, they are used to produce such signals as RF, FE, TE, and TE zero-cross signals. The preamplifier block is built in CD LSI PE5611B (IC201), whose parts are described individually below. Incidentally, as this LSI employs a single power supply (+ 3.3 V) specification, the reference voltages of this LSI and the pickup are the REFO (1.65 V) for both. The REFO is an output obtained from REFOUT in the LSI via the buffer amplifier, and is output from the pin 133 of this LSI. All measurements will be performed with this REFO as the reference.

Caution: Be careful not to short-circuit the REFO and GND when measuring.

1.1.1 APC (Automatic Power Control) circuit

Since laser diodes have extremely negative temperature characteristics in optical output when driven in constant current, it is necessary to control the current with the monitor diodes in order to keep the output constant. This is the feature of the APC circuit. The LD current is obtained by measuring the voltage between LD1 and V3R3, and divide the value by 7.5 (ohms), which becomes about 30 mA. The voltage difference between LD and V3R3 will be about 225 mV.

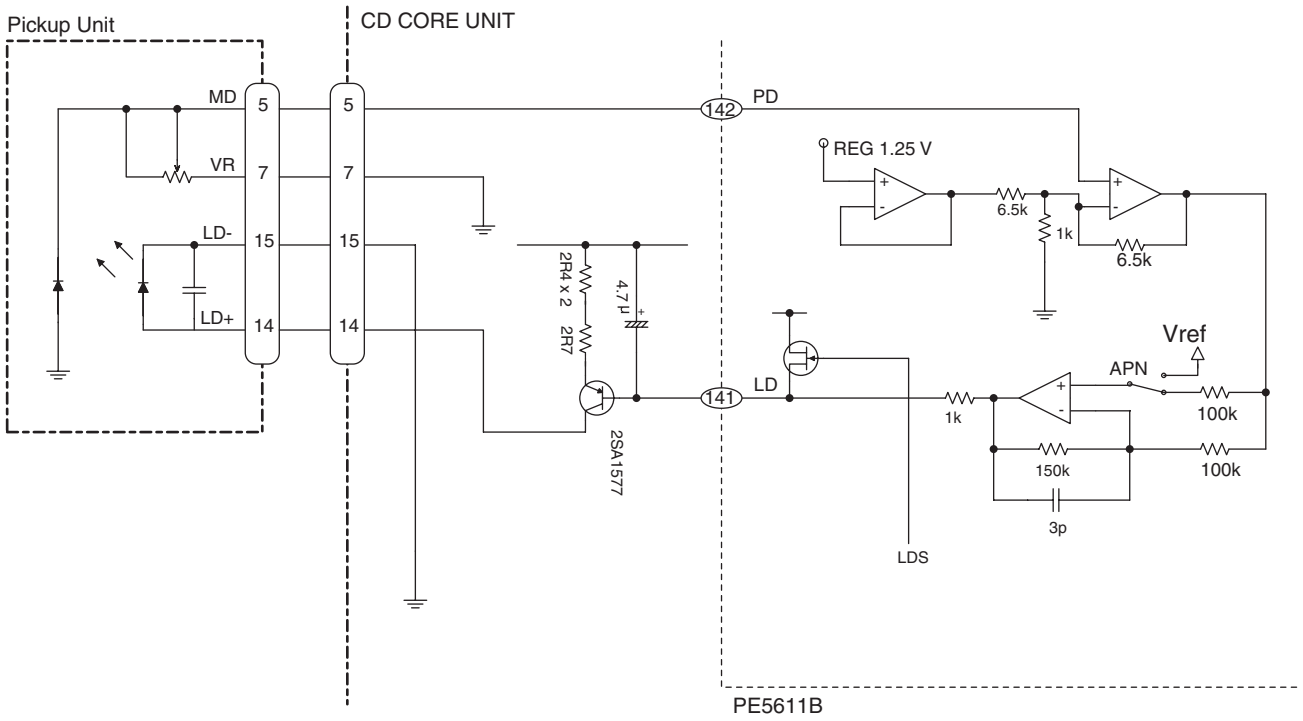


Fig.1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The output from the photo-detector (A + C) and (B + D) is provided from the RFO terminal as the RF signal (which can be used for eye-pattern check), after it is added, amplified, and equalized inside this LSI. The low frequency component of the voltage RFO is calculated as below.

RFO = (A + B + C + D) x 2

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFO signal, output from the pin 122, is A/C-coupled externally, input to the pin 121, and amplified in the RFAGC amplifier to obtain the RFAGC signal.

Also, this LSI is equipped with the RFAGC auto-adjustment function, explained below, which switches feedback gains of the RFAGC amplifier so that the RFO output will be 1.5 V.

This RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

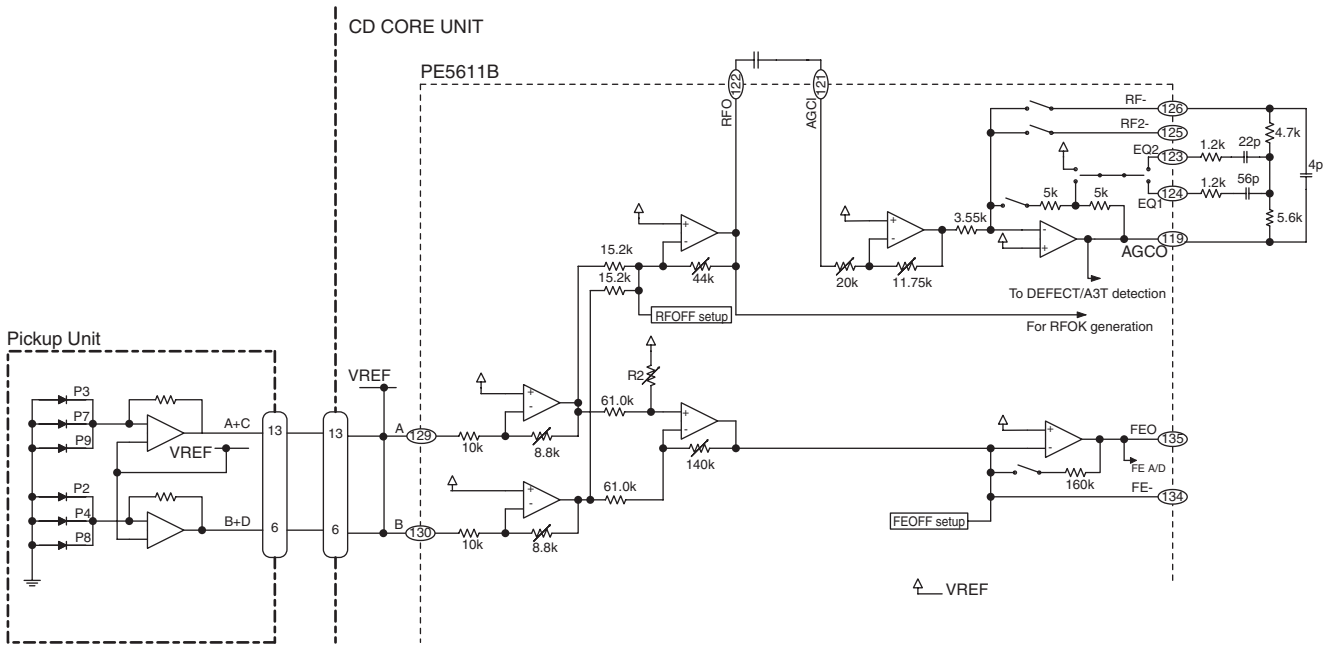


Fig.1.1.2 RF/AGC/FE

1.1.3 Focus error amplifier

The photo-detector outputs (A + C) and (B + D) are passed through the differential amplifier and the error amplifier, and (A + C - B - D) is provided from the pin 135 as the FE signal. The low frequency component of the voltage FE is calculated as below.

FE = (A + C - B - D) x 8.8k / 10k x 111k / 61k x 160k / 72k

= (A + C - B - D) x 3.5

For the FE outputs, an S-shaped curve of 1.5 Vp-p is obtained with the REFO as the reference. The cutoff frequency for the subsequent stage amplifiers is 14.6 kHz.

1.1.4 RFOK circuit

This circuit generates the RFOK signal, which indicates the timing to close the focus loop and focus-close status during the play mode, from the pin 70. As for the signal, "H" is output in closing the focus loop and during the play mode.

Additionally, the RFOK becomes "H" even in a non-pit area, since the DC level of the RFO signal is peak-held in the subsequent digital block and compared at a certain threshold level to generate the RFOK signal. Therefore, the focus is closed even on a mirror-surface area of a disc. This signal is also supplied to the microcomputer via the low-pass filer as the FOK signal, which is used for protection and gain switching of the RF amplifier.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are passed through the differential amplifier and the error amplifier to obtain (E - F), and then provided from the pin 138 as the TE signal. The low frequency component of the voltage TE is calculated as below.

TEO = (E - F) x 63k / 112k x 160k / 160k x 181k / 45.4k x 160k / 80k

= (E - F) x 4.48

For the TE output, TE waveform of about 1.3 Vp-p with the REFO as the reference. The cutoff frequency in the subsequent is 21.1 kHz.

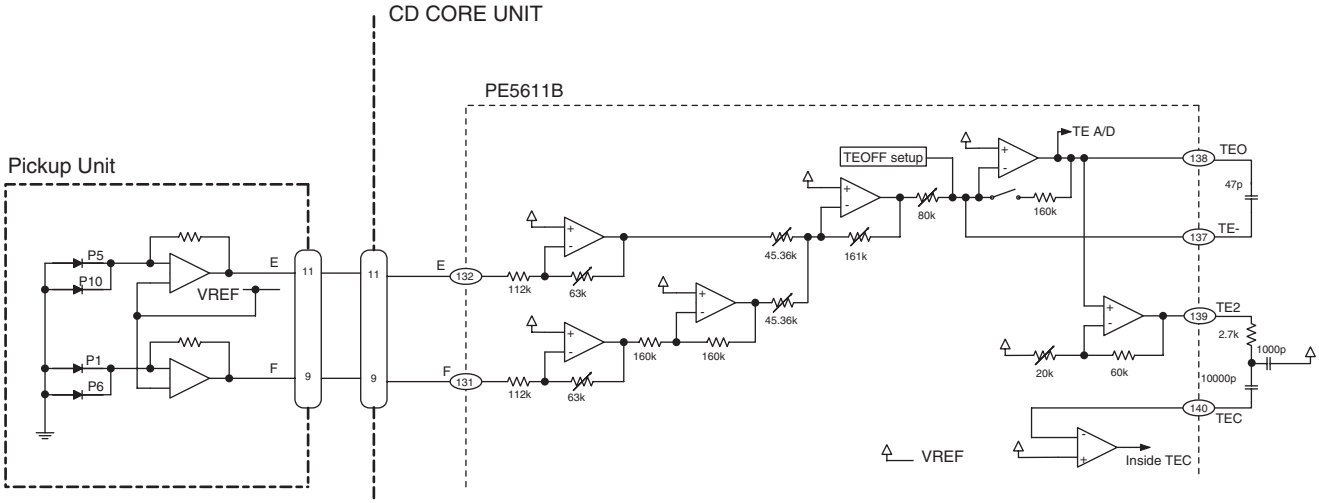


Fig.1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter referred to as TEC signal) is obtained by amplifying the TE signal by fourfold, and used to detect the tracking-error zero-cross point. As the purpose of detecting the zero-cross point, the following two points can be named:

1. To use for track-counting in the carriage move and track jump modes
2. To use for detecting the direction in which the lens moves in tracking close. (Used in the tracking brake circuit to be explained later.)

The frequency range of the TEC signal is from 300 Hz to 20 kHz, and

TEC voltage = TE level x 4

The TEC level can be calculated at 4.62 V, which, at this level, exceeds the D range of the operational amplifier, and clips the signal, but, because the CD LSI only uses the signal at the zero-cross point, it poses no particular problem.

1.1.7 EFM circuit

The EFM circuit converts the RF signal into digital signals of 0 and 1. The AGCO signal output from the pin 119 is A/C-coupled externally, input to the pin 118, and supplied to the EFM circuit.

Missing RF signal due to scratches and stains on the disc, and asymmetry of the upper and lower parts of the RF, caused by variation in disc production, cannot be entirely eliminated in AC coupling process, the reference voltage ASY of the EFM comparator is controlled, using the probability that 0 and 1 occur at 50%. Thus, the comparator level will always stay around the center of the RFO signal. This reference voltage ASY is generated by passing the EFM comparator output through the low-pass filter. The EFM signal is output from the pin 113.

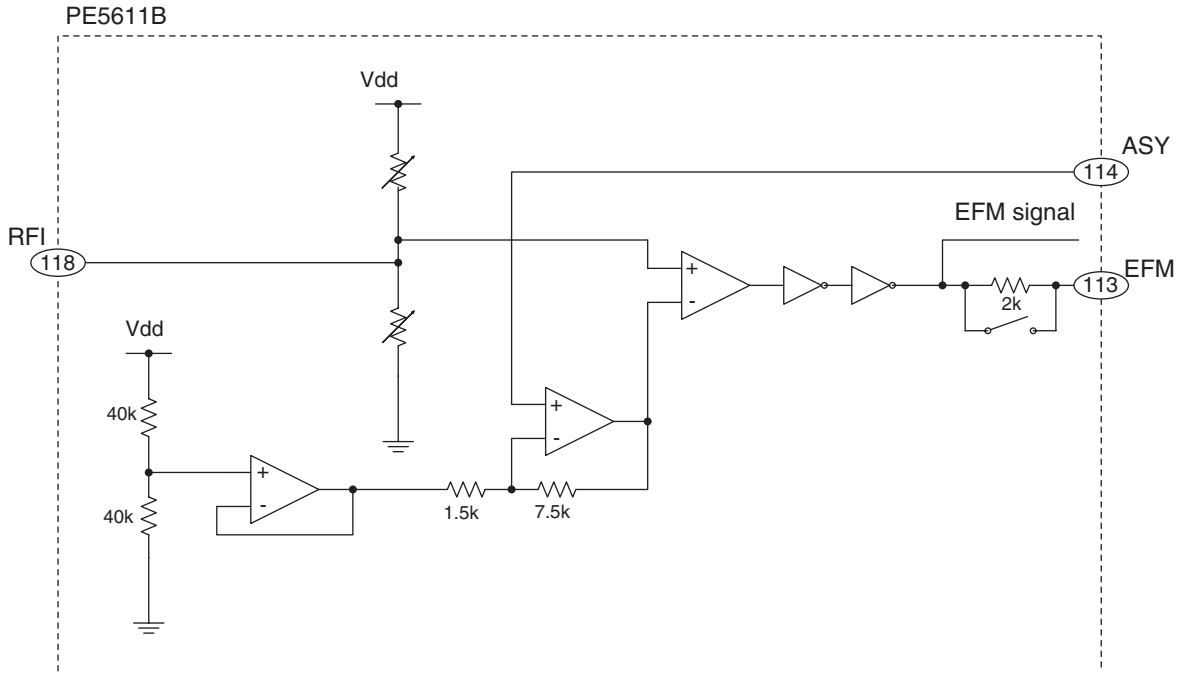


Fig.1.1.4 EFM

1.2 SERVO BLOCK (PE5611B: IC201)

The servo block performs servo control such as error signal equalizing, in-focus, track jump and carriage move. The DSP block is the signal-processing unit, where data decoding, error correction, and compensation are performed. The FE and TE signals, generated in the preamplifier stage, are A/D-converted, and output drive signals for the focus, tracking, and carriage systems via the servo block. Also, the EFM signal is decoded in the signal-processing unit, and ends up in outputting D/A-converted audio signals through the D/A converter. Furthermore, in this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to output the spindle drive signal.

Each drive signal for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are output as PWM3 data, and then converted to analog data through the LPF. These drive signals, after changed to analog form, can be monitored with the FIN, TIN, CIN, and SIN signals, respectively. Subsequently, the signals are amplified and supplied to the actuator and motor for each signal.

1.2.1 Focus servo system

The main equalizer of the focus servo consists of the digital equalizer block. The figure 1.2.1 shows the block diagram of the focus servo system.

In the focus servo system, it is necessary to move the lens within the in-focus range in order to close the focus loop. For that purpose, the in-focus point is looked for by moving the lens up and down with the focus search voltage of triangular signal. During this time, the rotation of the spindle motor is retained at a certain set speed by kicking the spindle motor.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus-close operations at an appropriate timing. The focus-close operation is performed when the following three conditions are satisfied at the same time:

1) The lens moves toward the disc surface.

2) RFOK = "H"

3) The FE signal is zero-crossed.

Consequently, the FE converges to "0" (= REFO).

When the above-mentioned conditions are met and the focus loop is closed, the FSS bit is shifted from "H" to "L," and then, in 10 ms, the CPU of the LSI starts monitoring the RFOK signal obtained through the low-pass filter.

If the RFOK signal is determined to be "L," the CPU of the LSI takes several actions including protection.

Fig.1.2.2 shows a series of actions concerning the focus close operations. (It shows a case where the focus loop cannot be closed.)

With the focus mode selector displaying 01 in the test mode, pressing the focus close button, allows to check the S-shaped curve, search voltage, and actual lens behavior.

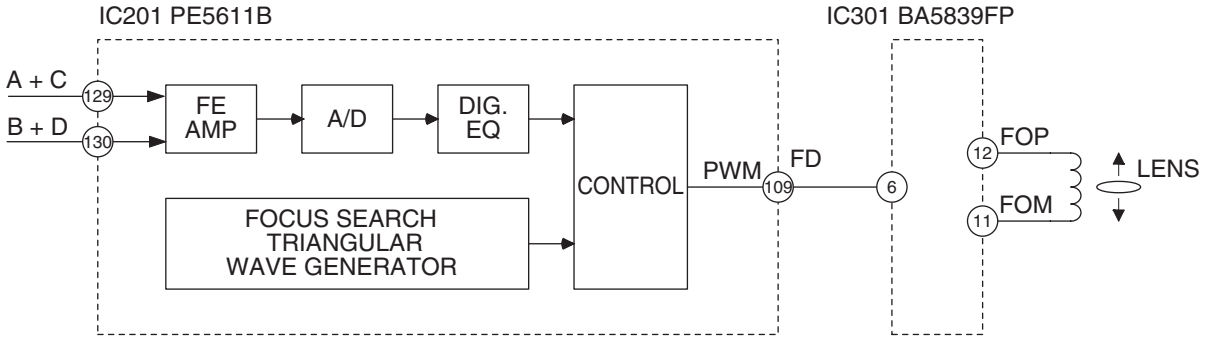


Fig.1.2.1 Block diagram of the focus servo system

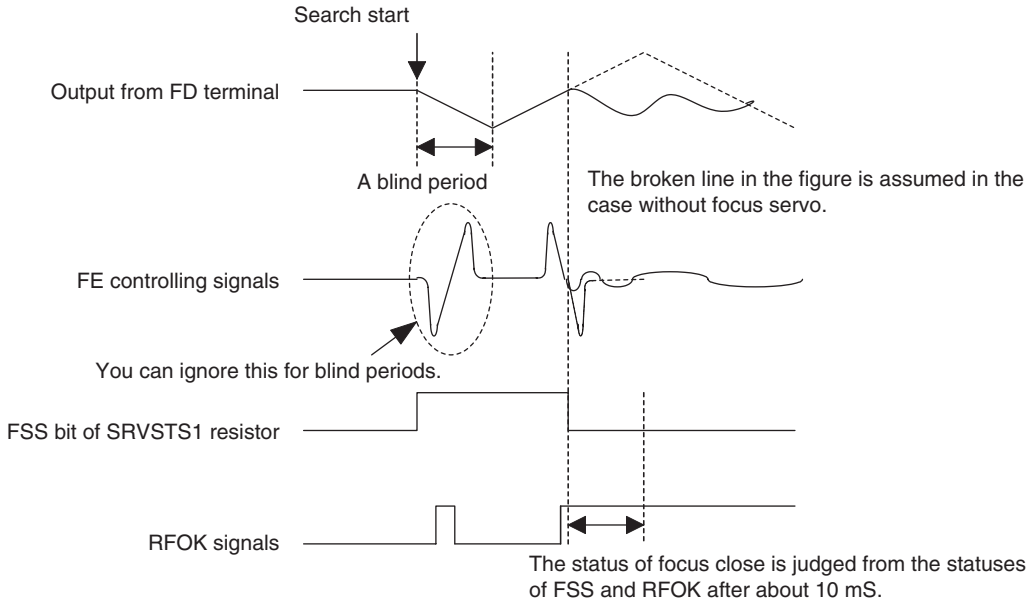

Search start
Output from FD terminal
A blind period
The broken line in the figure is assumed in the case without focus servo.
FE controlling signals
You can ignore this for blind periods.
FSS bit of SRVSTS1 resistor
RFOK signals
The status of focus close is judged from the statuses of FSS and RFOK after about 10 mS.

Fig.1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

The main equalizer of the tracking servo consists of the digital equalizer block. The figure 1.2.3 shows the block diagram of the tracking servo system.

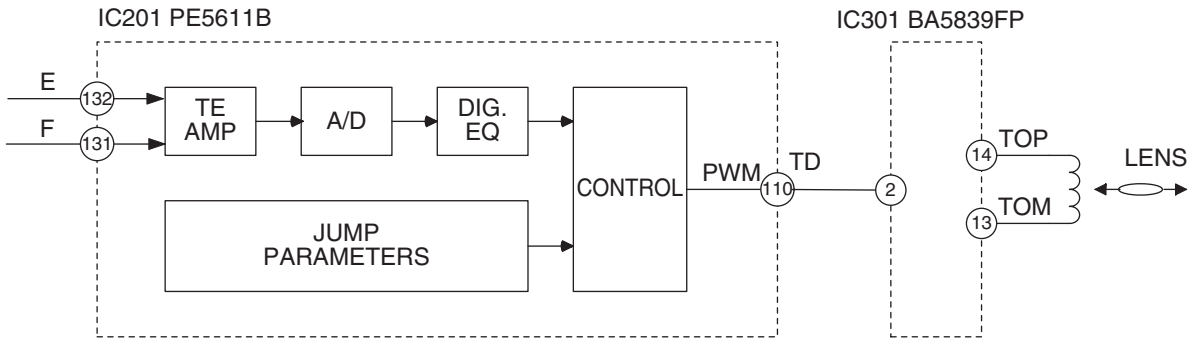


Fig.1.2.3 Block diagram of the tracking servo system

(a) The track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the CPU of the LSI. For the track jumps used in the search mode, a single track jump and four to 100 multi-track jump are available in this system. In the test mode, out of these track jumps, 1, 32, and 32 * 3 track jumps, as well as carriage move can be performed and checked in mode selection. In a track jump, the CPU of the LSI sets about half the number of the total tracks to jump (about five tracks for a 10-track jump), and the set number of tracks are counted using the TEC signal. By outputting the brake pulse for a certain period of time (set by the CPU of the LSI) from the time the set number is counted, and stopping the lens, the tracking loop can be closed so that the normal play can be continued.

Also, in order to facilitate closing of the tracking loop in a track jump, the brake circuit is kept ON for 50 msec, after the brake pulse is stopped, for increasing the tracking servo gain. The FF/REW action in the normal operation mode is realized by performing single jumps consecutively. The speed is approximately 10 times faster than in the normal mode.

(b) Brake circuit

Since the servo loop is not closed very well in the setup mode and track jump mode, the brake circuit is used for stabilizing the servo-loop close operation. The brake circuit detects the direction in which the lens moves, and outputs only the drive signal for the direction opposite to the movement to slow down the lens, thereby stabilizing the tracking servo-loop close operation. Additionally, the off-track direction is determined from the TEC and MIRR signals, as well as their phase relation.

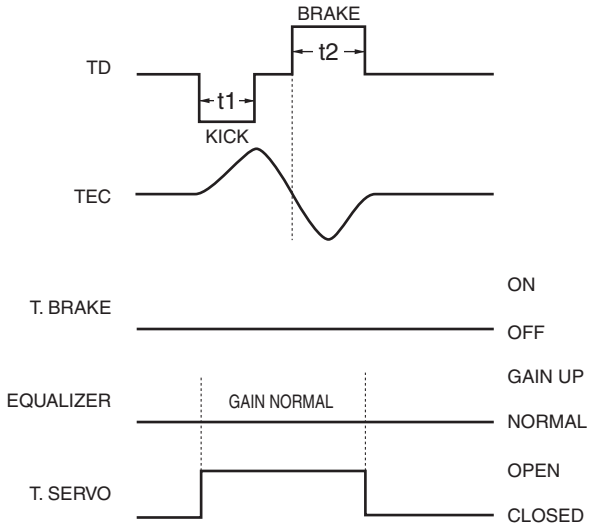


Fig.1.2.4 Single-track jump

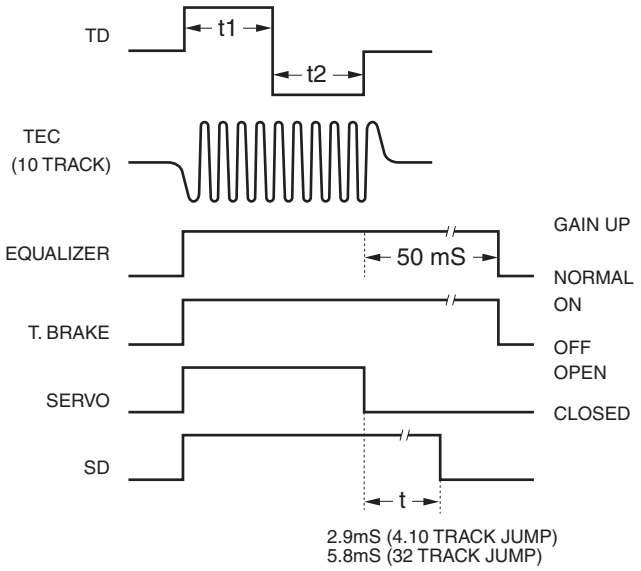
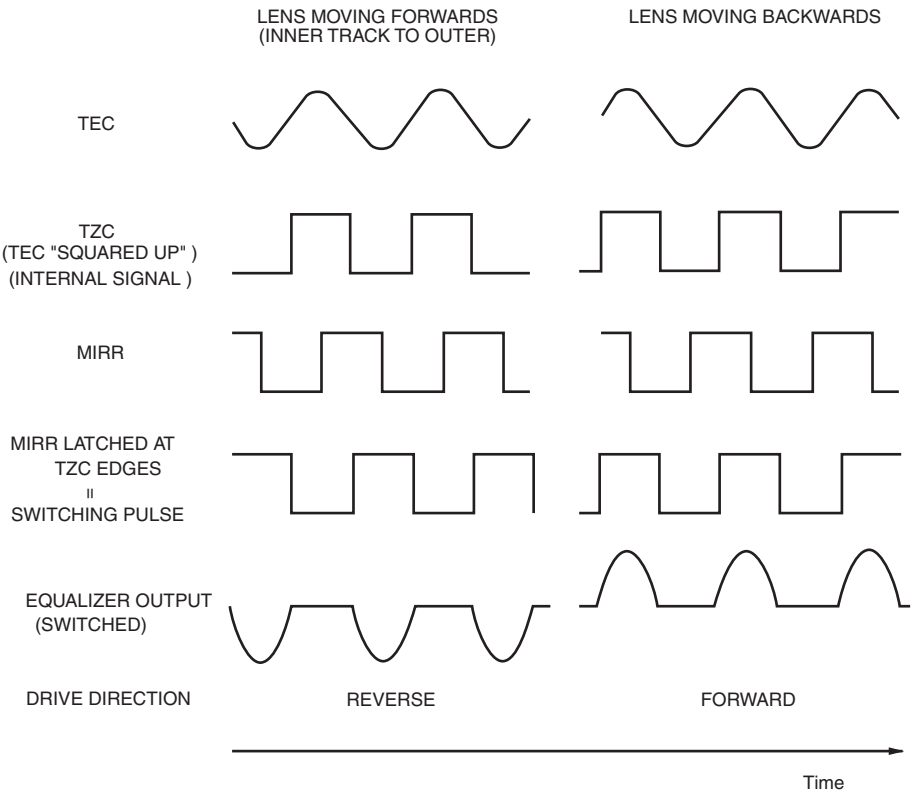


Fig.1.2.5 Multi-track jump



Note : Equalizer output assumed to hava same phase as TEC.

Fig.1.2.6 Track brake

1.2.3 Carriage servo system

The carriage servo system inputs the output of the low frequency component from the tracking equalizer (information on the lens position) to the carriage equalizer, and, after the gain is increased to a certain level, outputs the drive signal from the CD of the LSI. This signal is applied to the carriage motor via the driver IC.

Specifically, since it is necessary to move the whole pickup to the FORWARD direction when the lens offset reaches a certain level during the play mode, the equalizer gain is set to output higher voltage than the carriage motor starting voltage at this time. In actual operations, a certain threshold level is preset in the servo LSI for the equalizer output, and only when it exceeds the threshold level, the drive voltage will be output. This can reduce the power consumption. Also, before the whole pickup starts moving, the equalizer output voltage may exceed the threshold level a few times, due to such causes as eccentricity of discs. In this case, the output waveform of the drive voltage from the LSI assumes a pulse-like form.

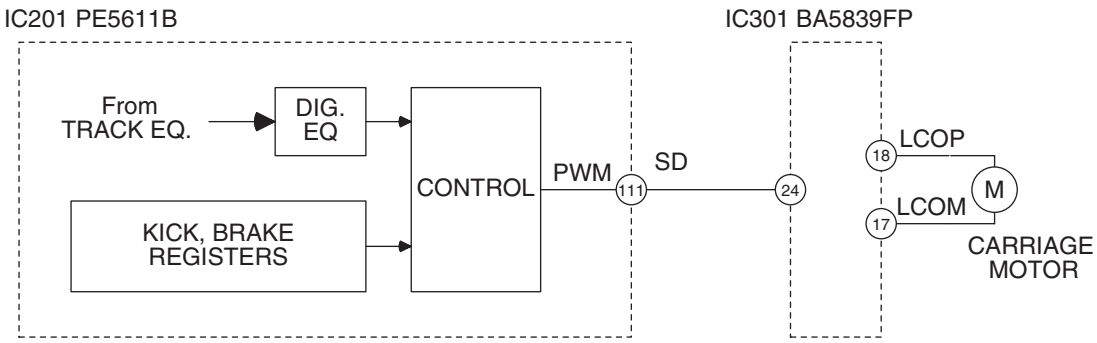


Fig.1.2.7 Block diagram for the carriage servo block

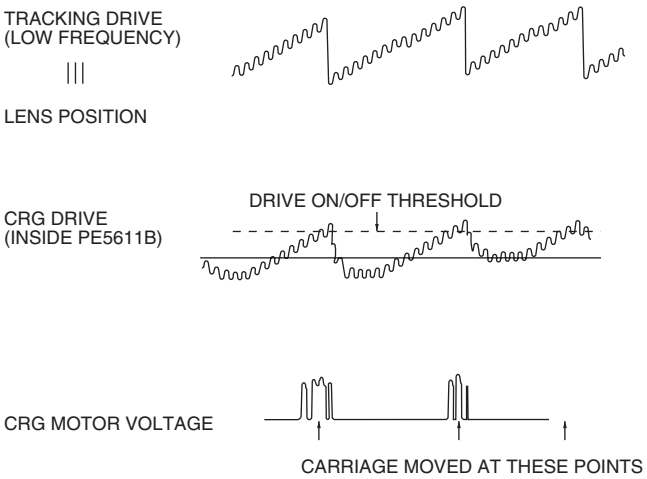


Fig.1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following modes are available:

1) Kick

Used to accelerate the disc rotation in the setup mode.

2) Offset

a. Used in the setup mode after the kick mode, until the TBAL adjustment is completed.

b. Used during the play mode when the focus loop is unlocked, until it is locked again.

In both cases, the mode is used to keep the disc rotation approximately normal.

3) Applicable servo

CLV servo mode, used in the normal operation.

In the EFM demodulation block, by WFCK/16 sampling whether the frame sync signal and the internal frame counter output are synchronized, a signal is created to show if they are "in-sync" or "non-sync." The status is not recognized as asynchronous until the signal is "non-sync" for eight consecutive times; otherwise it is recognized as synchronous. In the applicable servo mode, the leading-in servo mode is automatically selected in the asynchronous status, and the normal servo mode in the synchronous status.

4) Brake

Used to stop the spindle motor.

In accordance with the CPU of the LSI command, the brake voltage is sent out from the servo LSI. At this time, the EFM waveform is monitored inside the CD of the LSI, and when the longest EFM pattern exceeds a certain interval (or the rotation slows down enough), a flag is set inside the CD of the LSI, and the CPU of the LSI switches off the brake voltage. If a flag is not set within a certain period, the CPU of the LSI shifts the mode from the brake mode to the stop mode, and retains the mode for a certain period of time. If the mode switches to this stop mode in the eject operation, the disc will be ejected after the period of time mentioned above elapses.

5) Stop

Used when the power is turned on and during the eject operation. In the stop mode, the voltage in both ends of the spindle motor is 0 V.

6) Rough servo

Used in carriage feed (carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, the "H" or "L" level is input to the spindle equalizer. In the test mode, this mode is also used for grating confirmation.

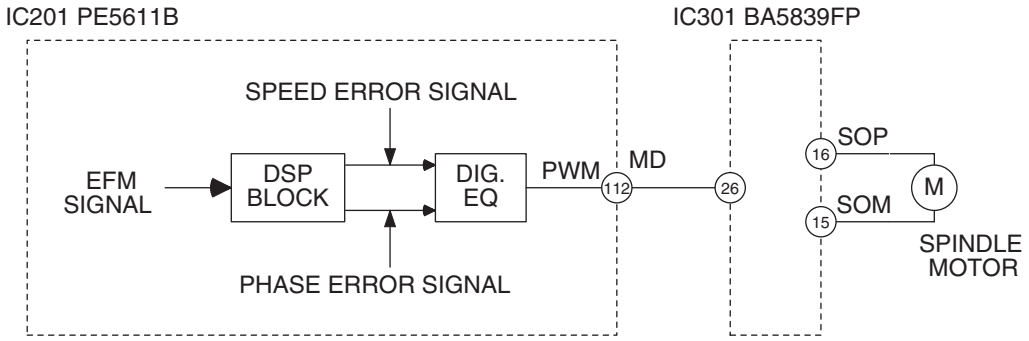


Fig.1.2.9 Block diagram of the spindle servo system

1.3 AUTOMATIC ADJUSTMENT FUNCTION

In this system, all the circuit adjustments are automated inside the CD of the LSI.
All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key.
Details of each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

In this adjustment the TE, FE, and RF amplifier offsets of the preamplifier block in POWER ON are adjusted to the respective target values with the REFO as reference. (The target values for TE, FE, and RF offsets are 0 V, 0 V, and - 0.8 V, respectively.)

Adjusting procedure

1) The CPU of the LSI reads respective offsets through the CD of the LSI, when they are in LDOFF status.
2) The CPU of the LSI calculates the voltages for correction from the values read in 1), and substitutes the corrected values to prescribed places to adjust.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment equalizes the output difference of the E-ch and F-ch from the pickup by changing the amplifier gain inside the CD of the LSI. In actual operation, adjustment is performed so that the TE waveform becomes symmetrical on each side of the REFO.

Adjusting procedure

1) After closing the focus loop,
2) Kick the lens in the radial direction to ensure the generation of the TE waveform.
3) The CPU of the LSI reads the offset amount of the TE signal calculated in the LSI at the time through the CD of the LSI.
4) The CPU of the LSI determines the offset amount is 0, positive, or negative.
- When the offset amount is 0, the adjustment is completed.
- When the offset amount is positive or negative, the amp gains for E-ch and F-ch should be changed, following a certain rule.

Then, steps 2) to 4) are repeated until the offset amount becomes 0 or the repetition reaches the limit number of times.

1.3.3 FE bias auto-adjustment

This adjustment is to maximizes the RFO level by optimizing the focus point during the play mode, utilizing the phase difference between the 3T level waveform of the RF waveform and that of when focus error disturbance is input. This adjustment is performed at the same timing as the auto-gain control, which will be described later, since disturbance is input to the focus loop.

Adjusting procedure

1) The CPU of the LSI issues the command to introduce disturbance to the focus loop (inside the CD of the servo LSI).
2) The waver of the 3T component of the RF signal is detected in the CD of the LSI.
3) The relation between the 3T component above and the disturbance is processed inside the CD of the LSI to detect the volume and direction of the focus offset.
4) The CPU of the LSI issues a command and reads out the detected results from the CD of the LSI.
5) The CPU of the LSI calculates the necessary correction and substitutes the result to the bias adjustment term inside the CD of the LSI.

Additionally, in this adjusting, a series of steps are repeated for better adjustment accuracy, the same as in the auto-gain control.

1.3.4 Focus and tracking AGC

This adjustment is to automatically adjust the focus and tracking servo loop gains.

Adjusting procedure

1) Introduce disturbance to the servo loop.

2) The error signals (FE and TE) when disturbance is introduced are extracted through the band pass filter, to obtain the G1 and G2 signals.

3) The CPU of the LSI reads the G1 and G2 signals through the CD of the LSI.

4) The CPU of the LSI calculates the necessary correction and performs the loop gain adjustment inside the CD of the LSI.

For increased adjustment accuracy, the same adjustment process is repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment is to adjust the dispersion of the RF level (RFO), which may be caused by mechanism or disc-related factors, to a steady value for reliable signal transmission. The adjustment is performed by changing the amp gain between RFO and RFAGC.

Adjusting procedure

1) The CPU of the LSI issues a command and reads out the output from the RF level detection circuit inside the CD of the LSI.

2) From the read values, the CPU of the LSI calculates the amp gain to change the RFO level to the target.

3) The CPU of the LSI sends a command to the CD of the LSI to adjust the amp gain to the level calculated in 2).

This adjustment is performed

1) when only the focus close operation is completed during the setup mode, and

2) immediately before the setup is completed (or when the play mode is about to start).

1.3.6 Adjustment of gains in preamplifier stage

In this adjustment, when reflected beams from the disc surface are extremely weak, such as when the lens is dirty, or a CD-RW is played, gains in the whole RFAMP block (FE, TE, and RF amplifiers) are increased by + 6 dB or + 12 dB, depending on the situation.

Adjusting procedure

When the system determines that the reflected beams from the disc surface are extremely weak during the setup mode, the whole RFAMP gains will be increased by + 6 dB or + 12 dB.

1.3.7 Initial values in adjustment

All automatic adjustments immediately after inserting a disc are performed based on the initial values. Automatic adjustments by source change or ACC ON are basically performed using the previous adjustment values as the initial values.

1.3.8 Coefficient display of adjustment results

For some of the adjustments (FE and RF offset, FZD cancel, F and T gains, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

The coefficient display in each auto adjustment is as follows:

1) FE and RF offset

Reference value = 32 (coefficient of 32 indicates that no adjustment is required)

The value is displayed in the unit of approximately 32 mV.

Ex. When the FE offset coefficient is 35,

35 - 32 = 3 x 32 mV = 96 mV

The correction is about +96 mV, which means the FE offset before adjustment is - 96 mV.

2) F and T gain adjustment

Reference value for focus and tracking = 20

The displayed coefficient / the reference value indicates the adjusted gain.

Ex. When the AGC coefficient is 40,

adjustment of 40 / 20 = 2 times (+ 6 dB) has been performed.

(It means that the original loop gain was half the target, and the whole gain was doubled to obtain the target value.)

3) RF level adjustment (RFAGC)

Reference value = 8

The coefficient of 9 to 15 indicates to increase the RF level

(for more gains).

The coefficient of 7 to 10 indicates to decrease the RF level

(for less gains).

When the coefficient changes by 1, the gain changes by 0.7 to 1 dB.

When the coefficient is 15, the gain is the maximum at TYP + 7.9 dB.

When the coefficient is 0, the gain is the minimum at TYP - 4.6 dB.

1.4 POWER SUPPLY AND LOADING BLOCK

For the power supply for this system, the VD (7.5 ± 0.5 V) and the VDD (3.3 ± 0.165 V), which are supplied from the motherboard, are used. The two power supplies, the VD mentioned above (for the drive system), and the VDD (for the LSI: 3.3 V), are used in this system.

The CPU of the LSI controls ON/OFF with "CONT", except for Load/Eject of the CD driver. For ON/OFF of the Loading drive, no particular control terminals are available, but the input signal "LOEJ" assumes an equivalent role. Also, the LCO output switches LOADING MODE and CARRIAGE MODE with "CLCONT".

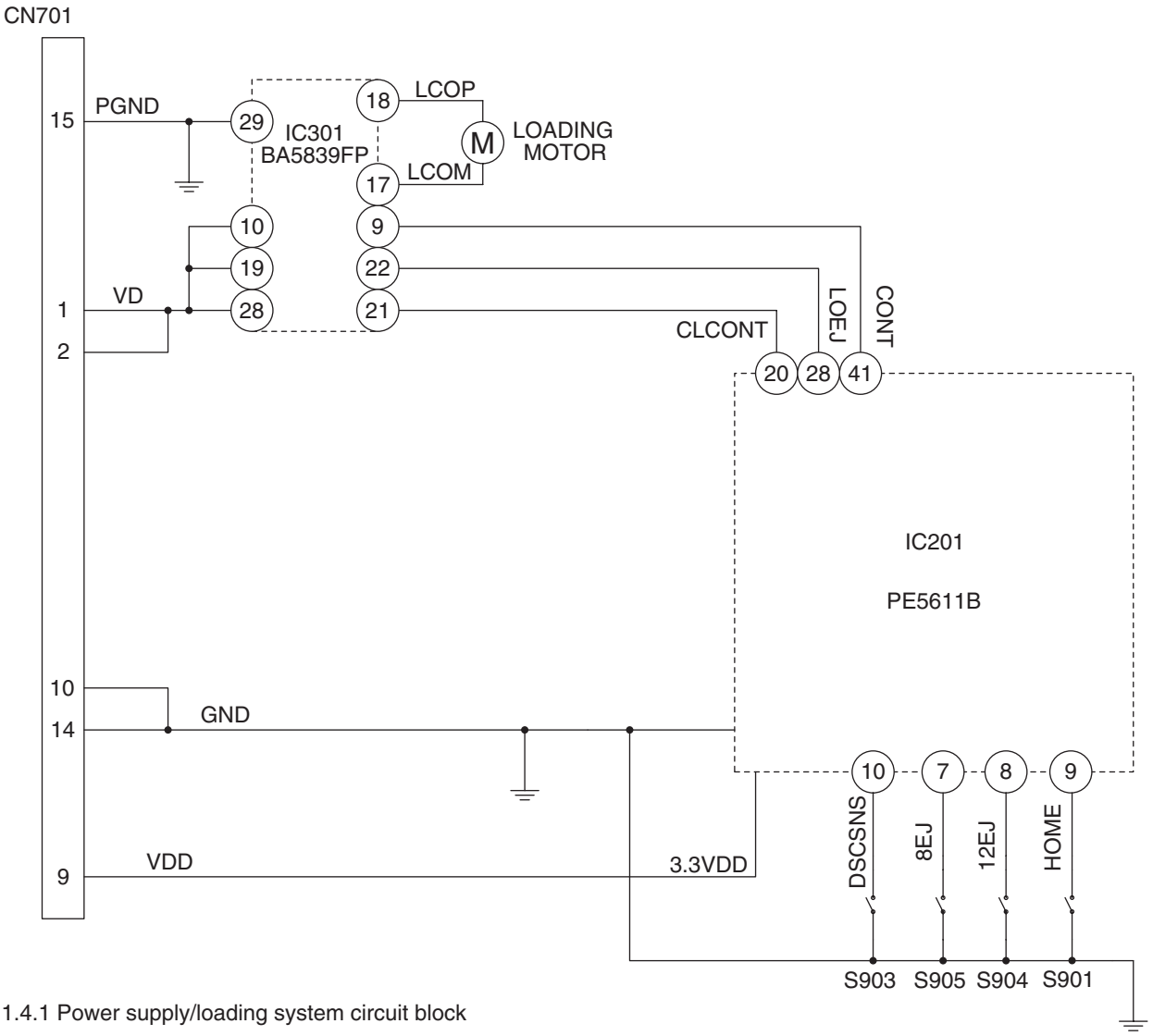


Fig.1.4.1 Power supply/loading system circuit block

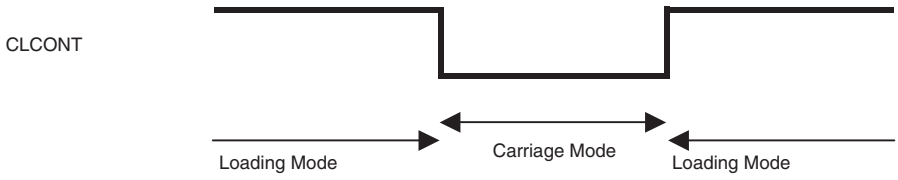


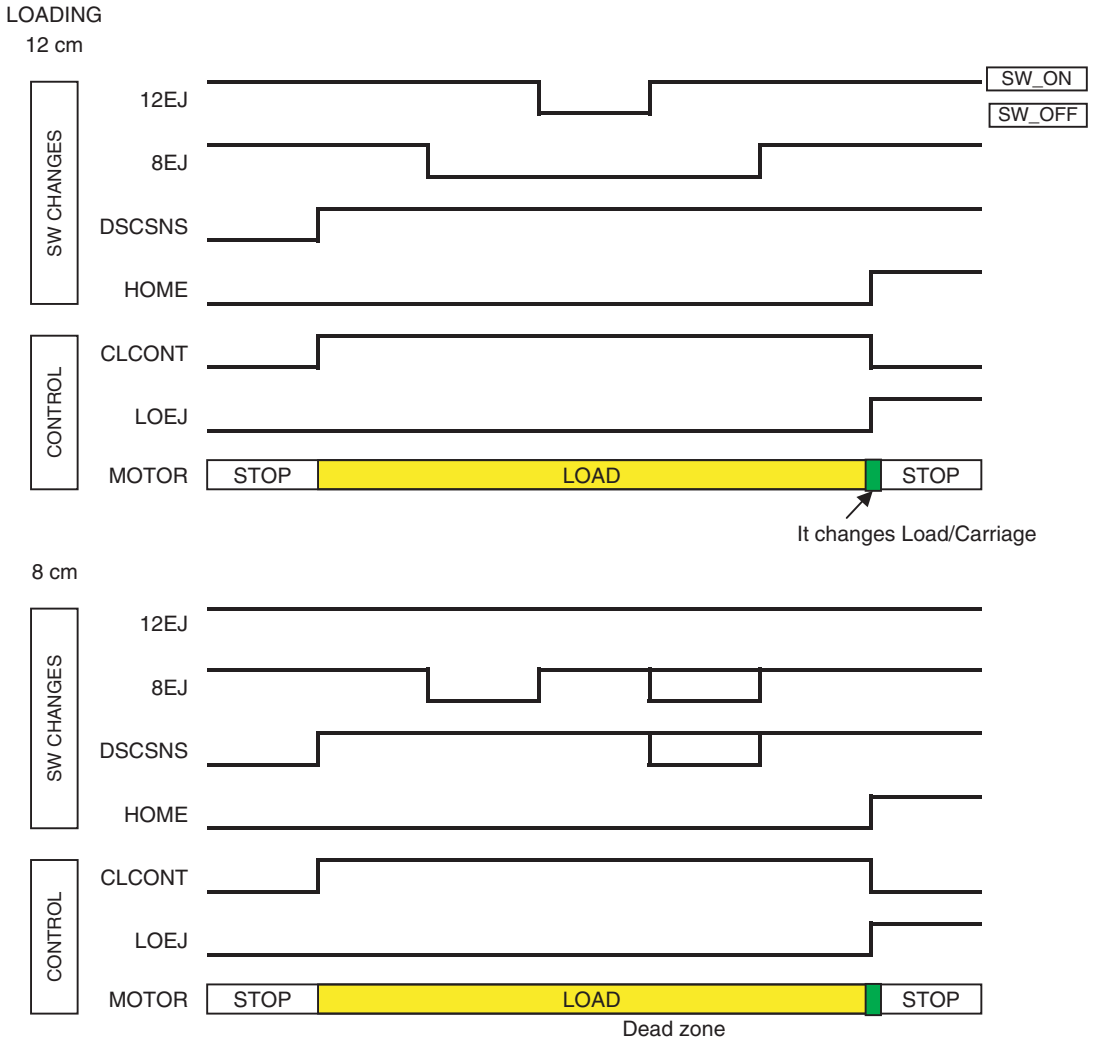
Fig.1.4.2 Loading/carriage mode shift

The load/eject operation is controlled with the status changes of the HOME switch (also used for clamp detection) on the mechanism unit and the three switches on the control unit. The ON/OFF statuses of these switches are respectively detected at the input port of the microcomputer.

Using the detection results in the microcomputer, each status (A to E) is determined. The disc size detection (8 or 12 cm) is also performed through this status change. Each status is shown in Fig.1.4.3 and the status change in Fig.1.4.4.

	Status	A	B	C	D	E
DSCSNS	SW1(S903)	OFF	ON	ON	ON	ON
8SW	SW2(S905)	ON	ON	OFF	OFF	ON
12SW	SW3(S904)	ON	ON	ON	OFF	ON
HOME	SW4(S901)	OFF	OFF	OFF	OFF	ON
	Mechanism state	With no disc	-	-	-	Clamp state

Fig.1.4.3 DSCSNS status



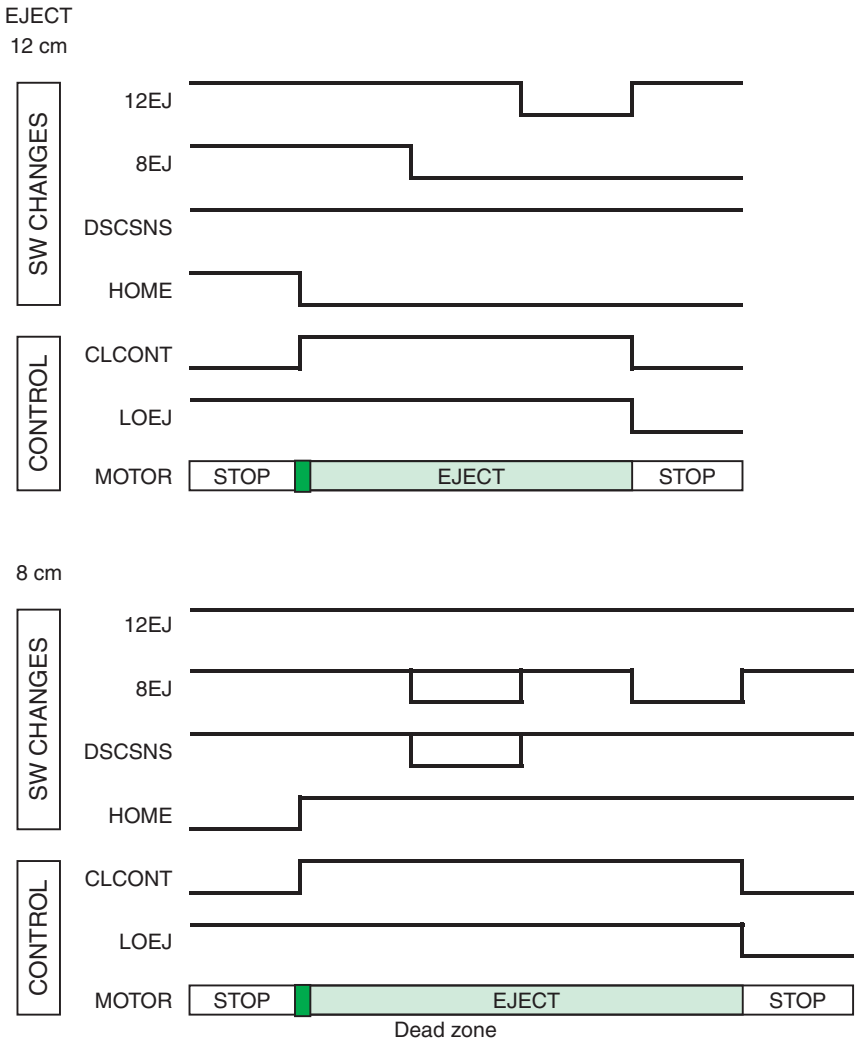


Fig.1.4.4 Status change in LOAD and EJECT modes

1.5 USB BLOCK

1.5.1 Outline

This product has a built-in USB2.0FS host controller and reads the compressed audio data from USB memory, portable device (MSC) or iPod.
The read data is transmitted to the LSI CPU block via the bus bridge connected to the USB host and serial interface and then to the LSI CD block.

1.5.2 Block diagram of USB functions

The USB host controller implements control from the PCI bridge in bus bridge via the PCI bus.
Compressed audio data of Mass Storage class is loaded into the bus bridge in Bulk transfer from USB device using DP (USB data +) and DM (USB data -).
The bus bridge controls by microcontroller serial transfer, universal port and external interrupt.
Compressed audio data received in serial transfer is transferred to the audio DSP in LSI CD block via the LSI CPU block and is reproduced.

The functions of the USB host controller and bus bridge are described as follows:

[USB host controller]

- Loads the compressed audio data from the USB device connected to the USB connector.
- OpenHCI Specification Release 1.0a compliant
- Supports Full-Speed (12 Mbps) USB devices.
- Supports Mass Storage class and Bulk transfer.
- System clock: 48 MHz (with clock oscillation stopping function)
- PCI clock: pclk = 27 MHz

[Bus bridge]

- Bridge circuit to connect between the USB host controller and LSI CPU block
- Decodes the serial data and converts it for PCI bus.
- Converts the data from PCI bus to serial data.
- Transfers directly to the RAM in USB_HOST bridge.
- PCI clock: pclk = 27 MHz
- Serial clock: sclk = 8.467 MHz

The block diagram of USB functions are provided as follows:

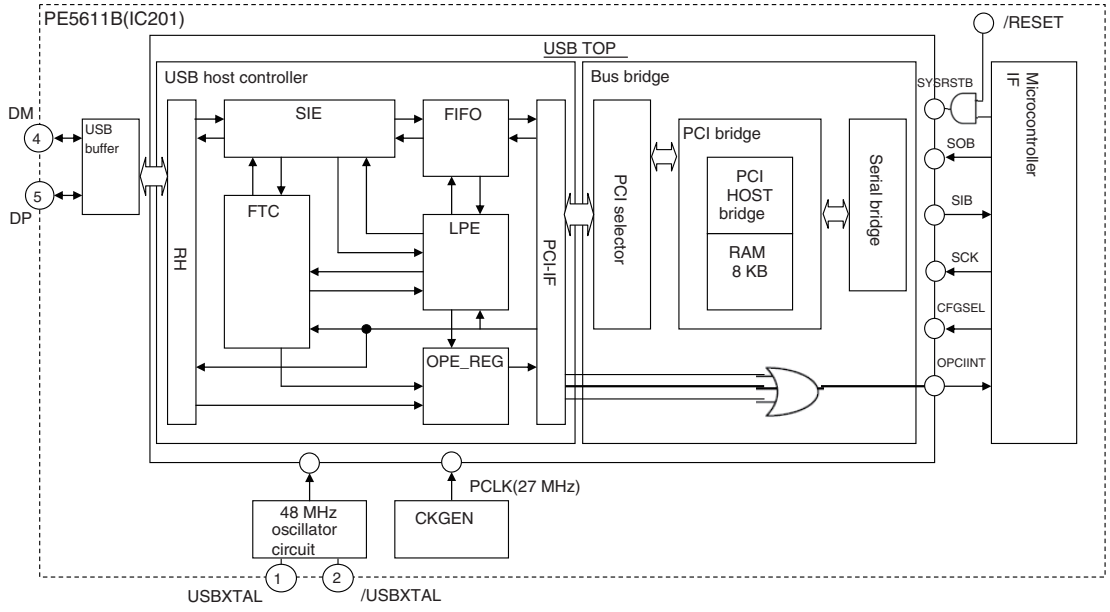


Fig.1.5.1 Block diagram of USB functions

[Description of block diagram of USB functions]
<USB host controller>

PCI_IF: Module for communication between the internal circuits of Host and PCI bus
FIFO: FIFO module for asynchronism absorption between the USB clock and PCI clock
LPE: Module to implement USB list processing
SIE: Module to implement serial-parallel and parallel-serial conversion, CRC processing and bit stuffing process on USB transfer data
FTC: Module to implement frame control for USB
RH: Module with the role of RootHub for USB. Implements USB buffer control.

<Bus bridge>

A circuit to connect between the serial I/F of LSI CPU block and USB host controller
Serial bridge: Module to connect between the microcontroller and PCI HOST bridge
PCI HOST bridge: Module to connect between the PCI bus, memory bus and RAM bus
RAM 8 KB: 8 KB SRAM module
PCI selector: Module to connect between the USB host and PCI bus

<Microcontroller I/F> LSI CPU block

SYSRSTB: Reset signal for USB host and bus bridge
SIB: Signal for bus bridge serial data output and microcontroller serial data input
SOB: Signal for bus bridge serial data input and microcontroller serial data output
SCKB: Serial clock signal for bus bridge. Microcontroller is the master.
OPCIINT: USB-related interrupt output from the bus bridge
CFGSEL: Register/RAM access switching signal

・CKGEN

Clock generator with multiplication PLL using the 16.934 4 MHz clock as the source
Generates 27 MHz clock by dividing the clock obtained by multiplying 16.934 4 MHz with 8 by 5.

・USB buffer

DP and DM buffer used in USB communication

・48 MHz oscillation circuit

The block that oscillates 48 MHz clock for the USB clock

1.5.3 Flow for audio output from the USB device

When a USB device is connected to the USB connector, the LSI (host controller) recognizes the device.
The host controller load the compressed audio data from the USB device connected to the USB connector.
The loaded compressed audio data is stored in the RAM on Bus Bridge.
The stored compressed audio data is loaded on LSI CPU block by serial transfer.
The compressed audio data by serial reception from CSI is transferred to the Buffer Controller in LSI CD block via LSI CPU block.
The data is stored in the built-in 1 Mbit SRAM by RAMPNT and is transferred to Audio DSP by PLYPNT.
The compressed audio data is decoded for each audio data and output to DAC I/F as audio data.
The digital audio data input from DAC I/F into Audio DAC is output as analog audio data.

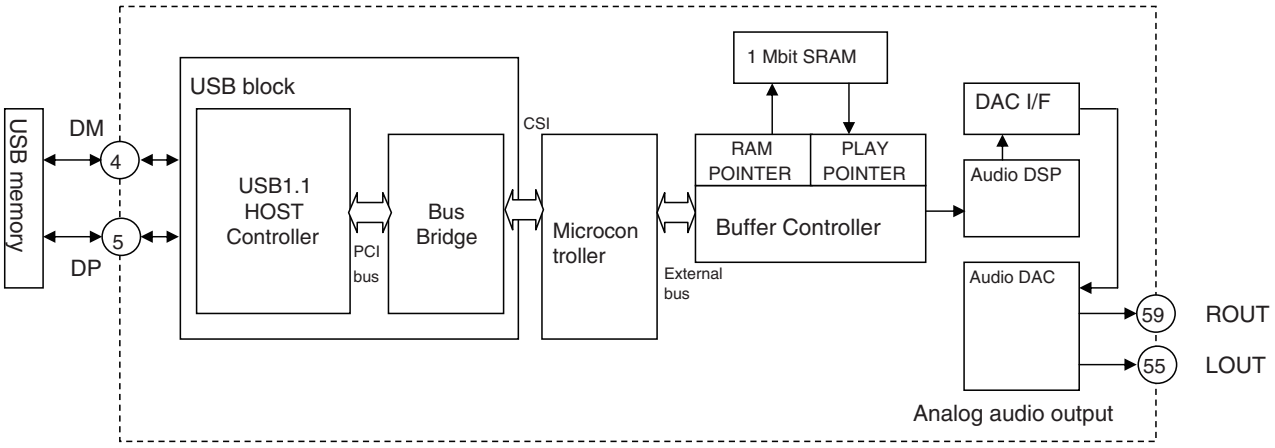


Fig.1.5.2 Flow for audio output from the USB device

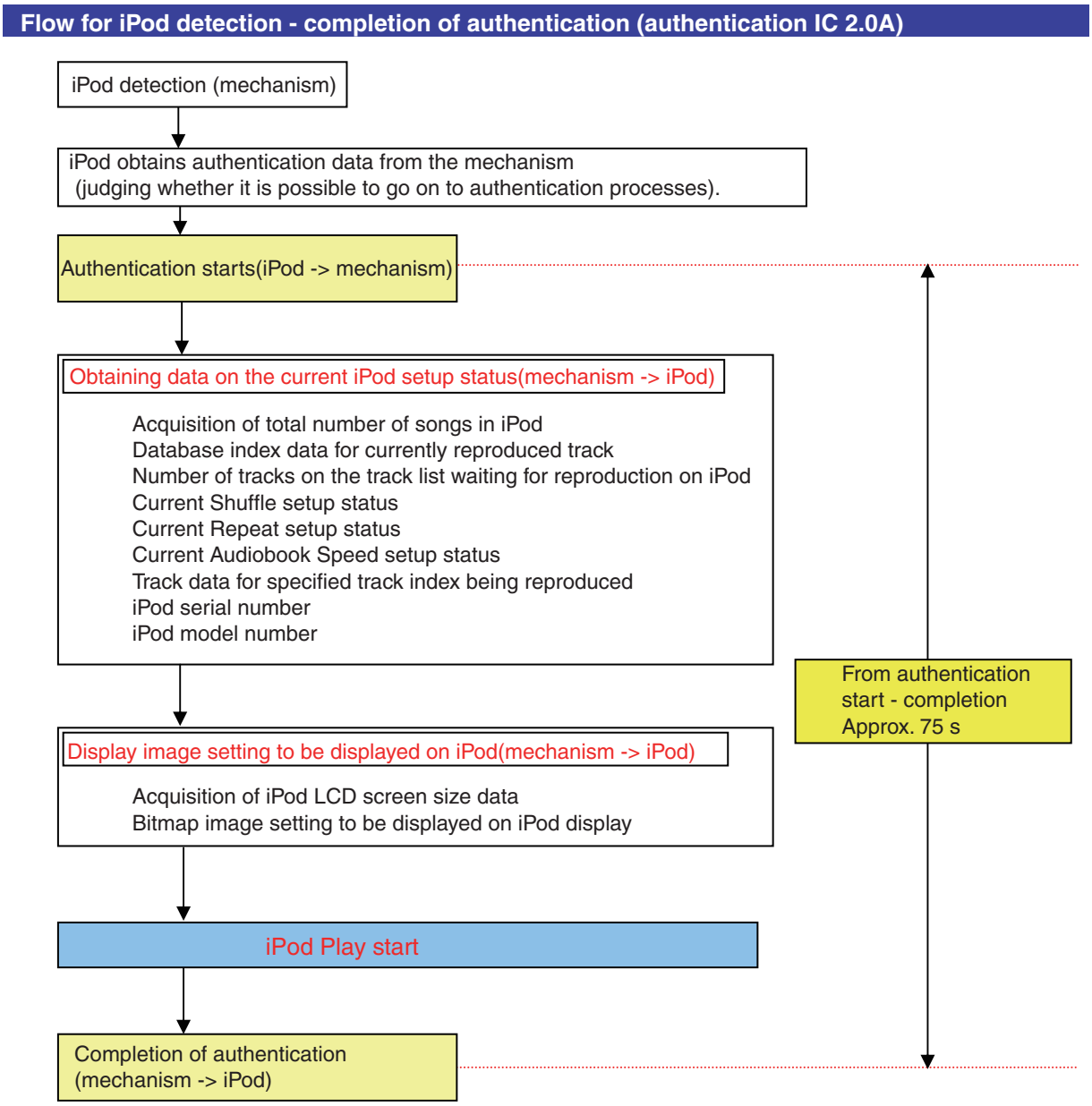
1.6 ABOUT iPod FUNCTIONS(iPod MODELS ONLY)

1.6.1 Outline

Unlike MSC devices, iPod executes all operations including PLAY/FF/REV and decoding of compressed file internally.
Digital audio data is transmitted to the mechanism through the USB block of LSI.
The mechanism will operate iPod by transmitting commands to iPod instead of file reproduction process and so forth.
Therefore the reproducible format and functions need to be compliant with iPod.
In addition, digital streaming may be impossible depending on the iPod generation and the firmware version.
These devices are handled as noncompliant devices and are not played.
iPod does not use the concept of folder configuration but access the category database.

1.6.2 iPod authentication flow

The flow from iPod detection to completion of authentication is shown as follows:

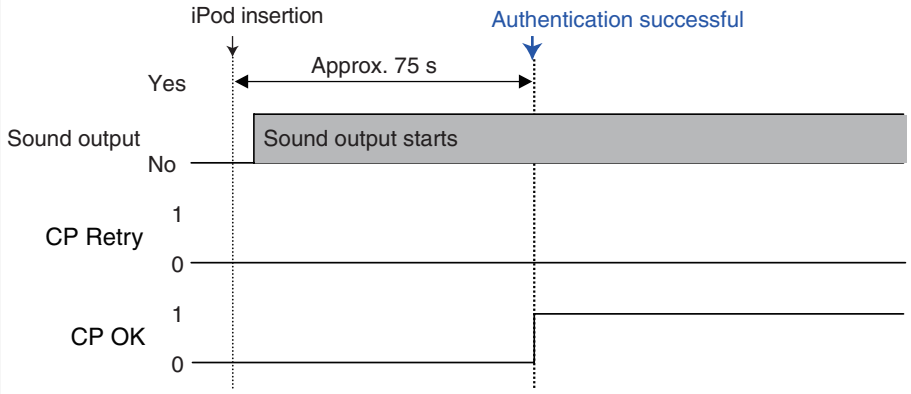

Flow for iPod detection - completion of authentication (authentication IC 2.0A)
iPod detection (mechanism)
iPod obtains authentication data from the mechanism
(judging whether it is possible to go on to authentication processes).
Authentication starts(iPod -> mechanism)
Obtaining data on the current iPod setup status(mechanism -> iPod)
Acquisition of total number of songs in iPod
Database index data for currently reproduced track
Number of tracks on the track list waiting for reproduction on iPod
Current Shuffle setup status
Current Repeat setup status
Current Audiobook Speed setup status
Track data for specified track index being reproduced
iPod serial number
iPod model number
Display image setting to be displayed on iPod(mechanism -> iPod)
Acquisition of iPod LCD screen size data
Bitmap image setting to be displayed on iPod display
iPod Play start
Completion of authentication
(mechanism -> iPod)
From authentication
start - completion
Approx. 75 s

The status during iPod authentication is also provided as follows:

Authentication status when iPod is inserted

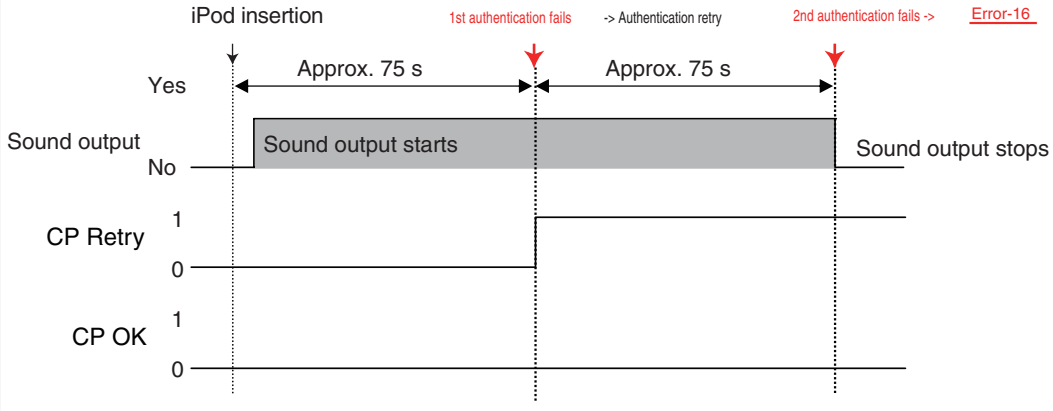
When iPod is inserted, authentication operation is executed between the CD mechanism (mounted with iPod authentication IC) and iPod.
Operation (status) by the CD mechanism and iPod in this case are shown as follows:

[When authentication is OK]
When authentication is successful in 1 try, sound output is continued (authentication OK).
When authentication fails in the 1st try and is successful in the 2nd try, sound output is continued (authentication OK).



* CP OK bit is set to "1" when authentication is successful.
* Since authentication is successful, CP Retry remains "0."

[When authentication is NG]
When authentication fails in the 1st try, the second authentication operation starts.
When authentication fails again in the 2nd try, ERR-16 (iPod authentication error) occurs and sound output is stopped (authentication NG).

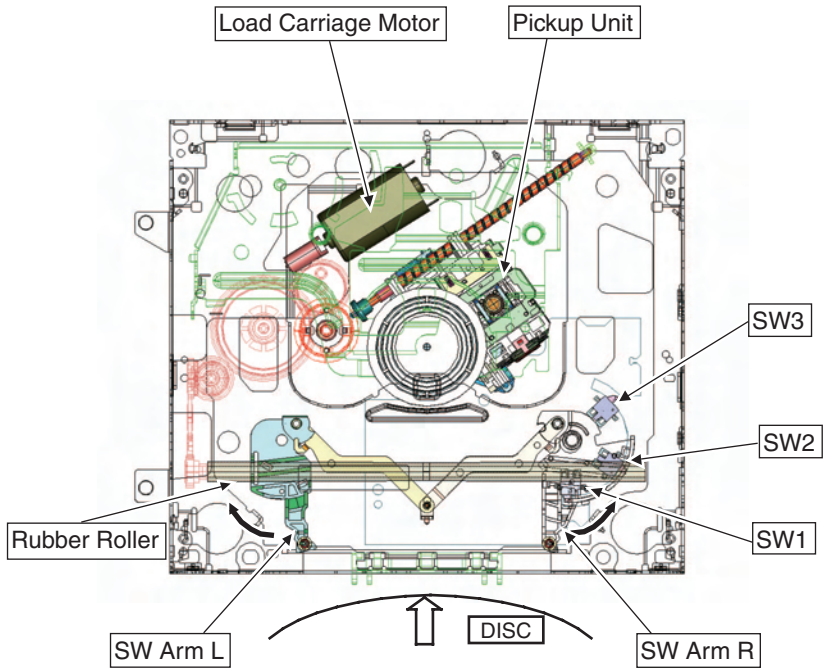


* When authentication retry starts, CP Retry bit is set to "1."
* Since authentication failed, CP Retry remains "0."
* Since authentication failed, Error-16 is generated and sound output is stopped.

2. MECHANISM DESCRIPTIONS

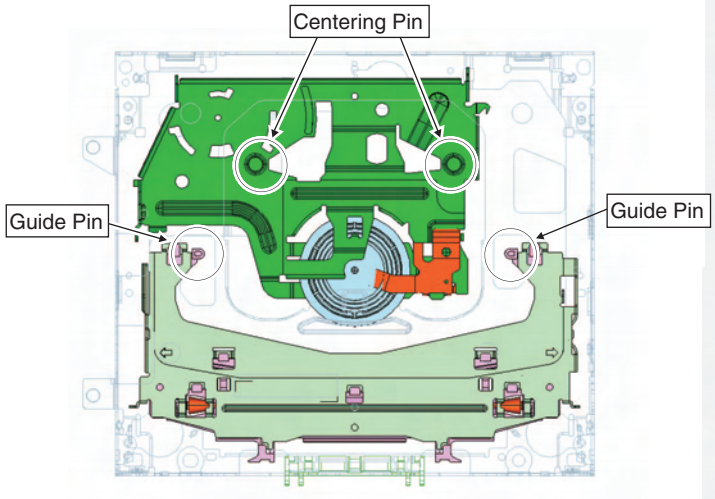
● Loading actions

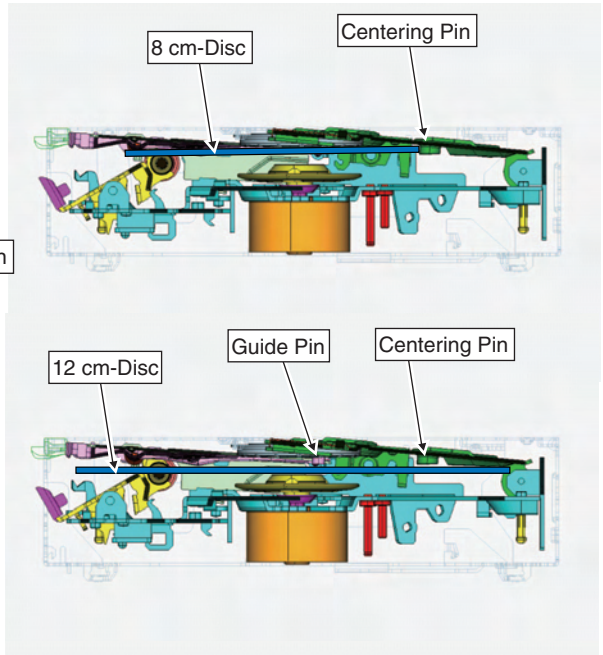
1. When a disc is inserted, SW Arm L and R rotate and SW1 is switched from ON to OFF.
   When SW1 is switched from ON to OFF, the Load Carriage Motor is started and the rubber roller rotates.
2. If the disc is a 12 cm-disc, SW3 is turned ON with SW Arm, and the microcomputer determines that the disc is a 12 cm-disc.
3. In case of an 8 cm-disc, SW3 is not turned ON, a clamp action is triggered, and the microcomputer determines that the disc is an 8 cm-disc.
   (The left and right of SW Arm are coupled, and when only one side is pushed, the coupled joint will lock, and the arms will not open more than a certain width (SW3 will not be turned ON).)



● Disc centering mechanism

1. 8 cm-disc is centered by the Guide Pins and the Centering Pins.
2. 12 cm-disc passes under the Guide Pins and the Centering Pins, and centered in the back position of the mechanism.





● Clamp actions mechanism

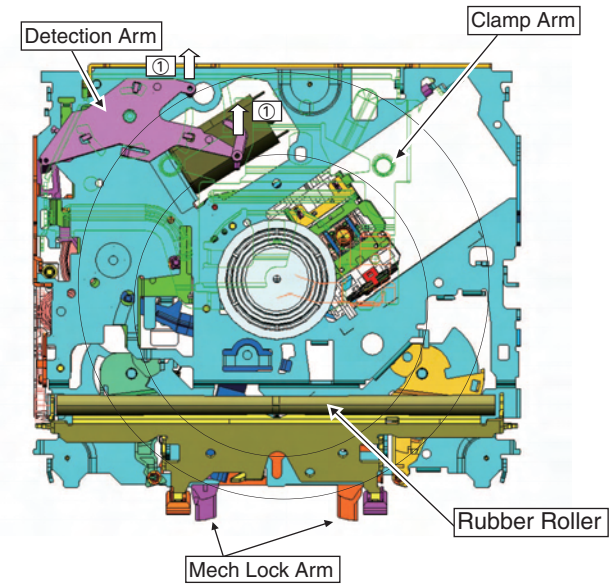
1. With an 8 or 12 cm-disc centered on the spindle, the Detection Arm is moved.
2. The movement of the Detection Arm engages the Loading Rack with the 2-Stage Gear.
3. The Clamp Lever slides and lowers the Clamp Arm (the disc is clamped).

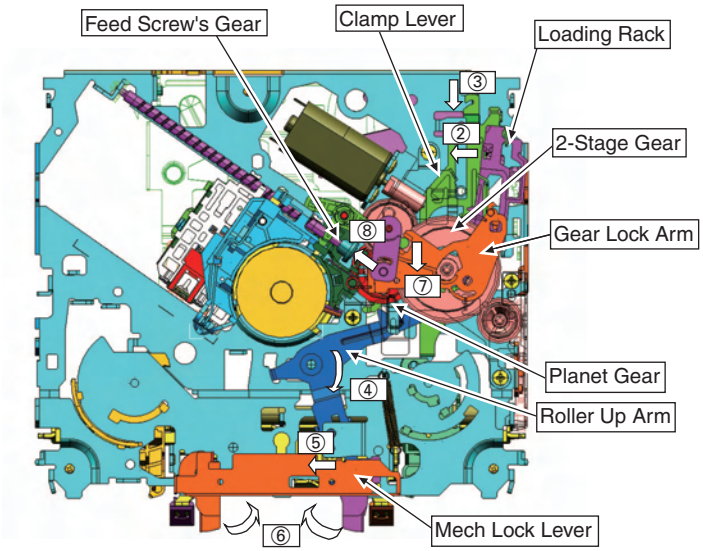
At the same time, the Roller Up Arm is rotated, and the Rubber Roller is separated from the disc.

Also the arm slides the Mechanical Lock Lever, turns the Mechanical Lock Arm, and releases the mechanical lock, completing the clamp operation.

4. When the clamp action is completed, the Clamp Lever rotates the Gear Lock Arm.

When the arm is rotated, the Planet Gear is separated from the 2-Stage Gear and engaged with the gear of the pickup feed screw, and the carriage operation will start





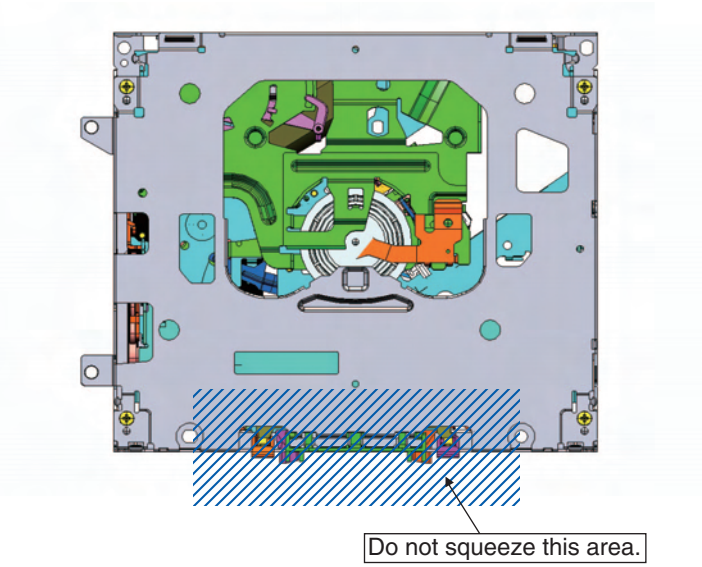
● Eject actions

1. When the Load Carriage Motor is rotated backward, and the pickup is fed to the inner periphery passing the home SW ON point, the eject action will start in the reverse order of the procedure mentioned earlier.
2. For a 12 cm-disc, Eject is completed when SW3 is switched OFF, ON, and OFF again.
3. For an 8 cm-disc, Eject is completed when SW2 is switched OFF, ON, and OFF again.

3. DISASSEMBLY

● How to hold the Mechanism Unit

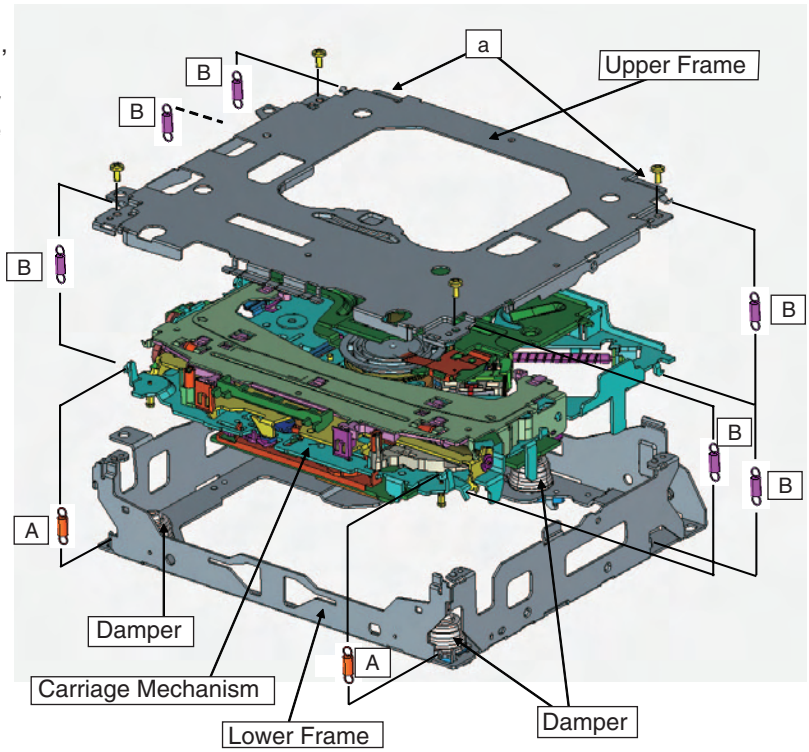
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

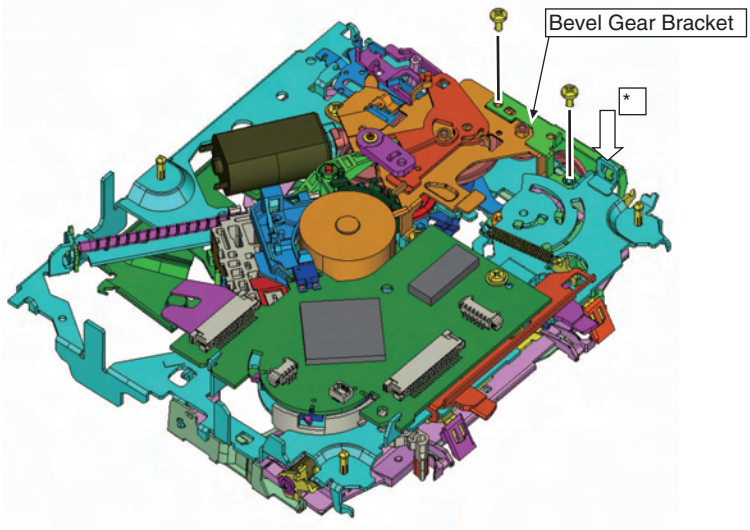
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.

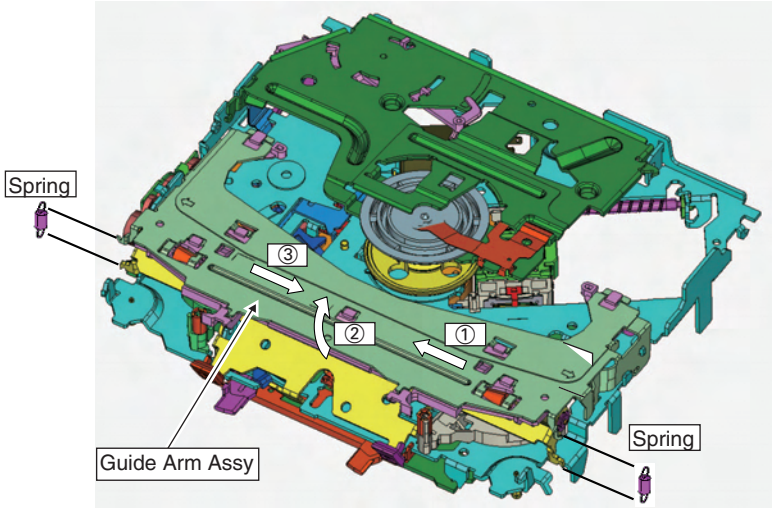


● Removing the Guide Arm Assy

1. Remove the Upper and Lower Frames and set the mechanism to the eject mode.
2. Remove the two Screws and Bevel Gear Bracket. (Note that the gears will come off.)
3. Remove the two Springs from the left and right sides.
4. Slide the Guide Arm Assy to the left, and turn it upward.
5. When it is turned about 45 degrees, slide it to the right and remove.

Caution: When assembling, assemble with the Bevel Gear Bracket moved to the direction of the arrow (*).

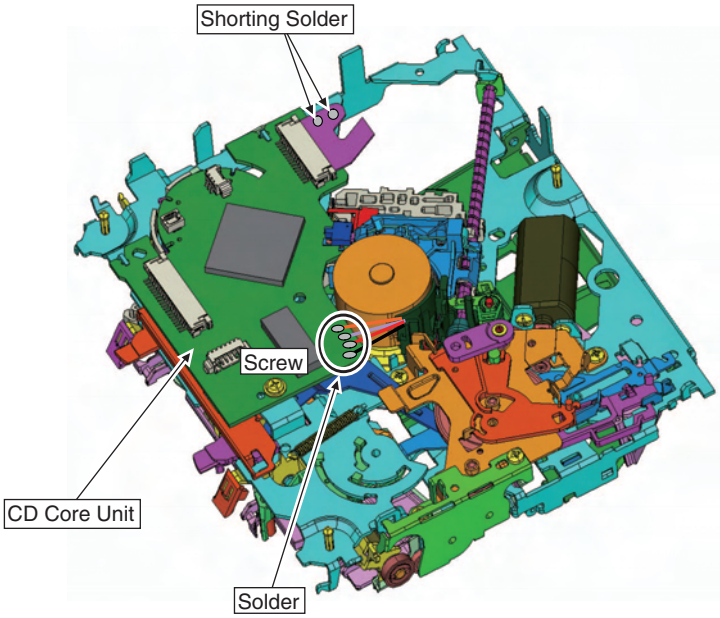




● How to remove the CD Core Unit

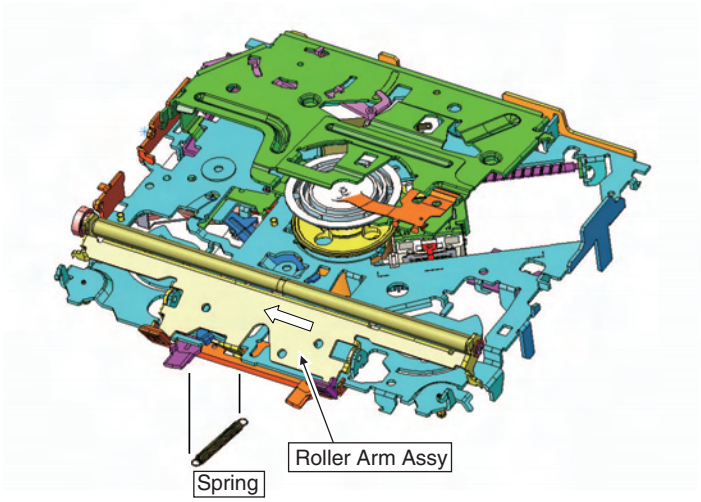
1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

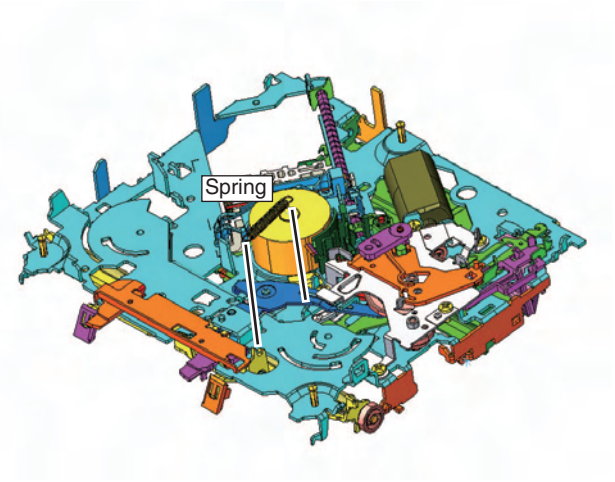
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



● How to remove the Roller Arm Assy

1. Remove the Guide Arm Assy.
2. Remove the CD Core Unit. (If the Spring can be removed, the unit need not be removed, depending on the type of CD Core Unit.)
3. Remove the Spring.
4. Slide the Roller Arm Assy to the left.



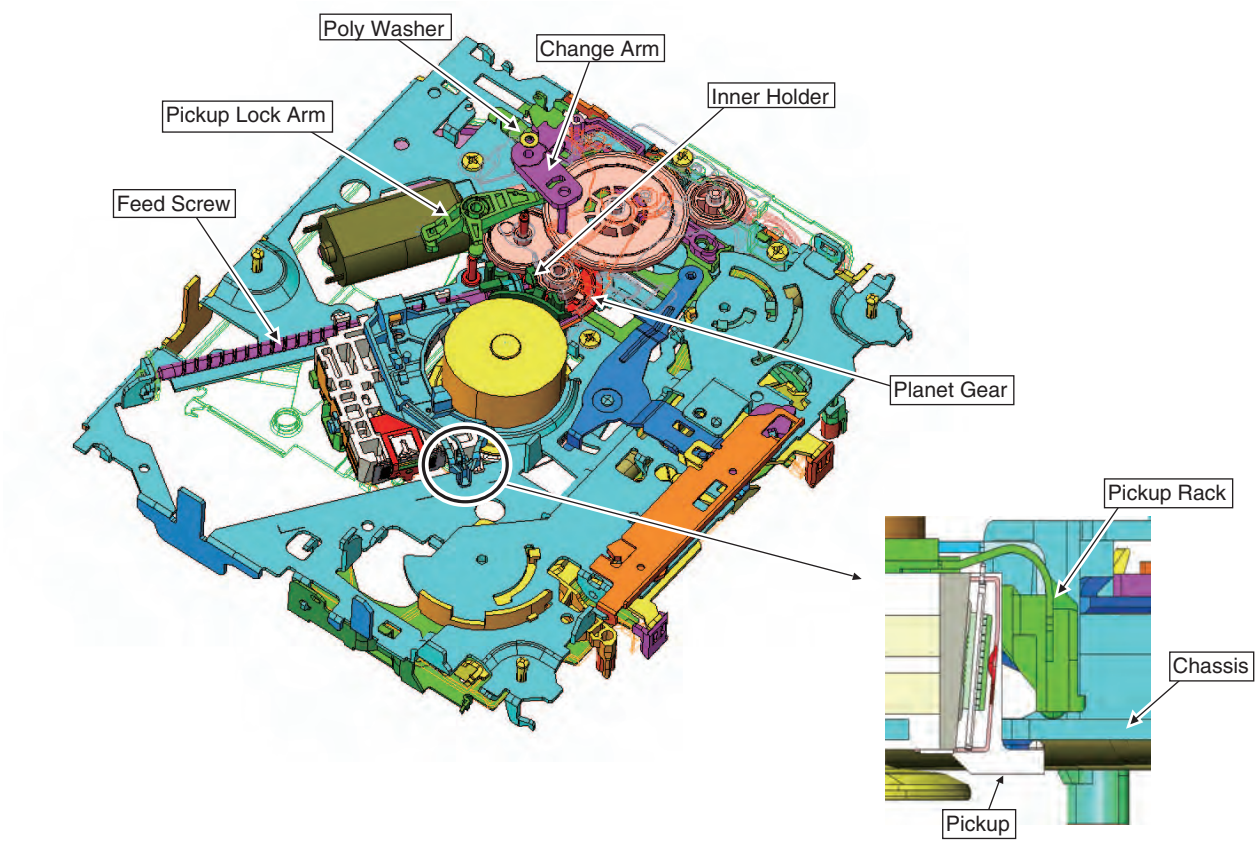


● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.

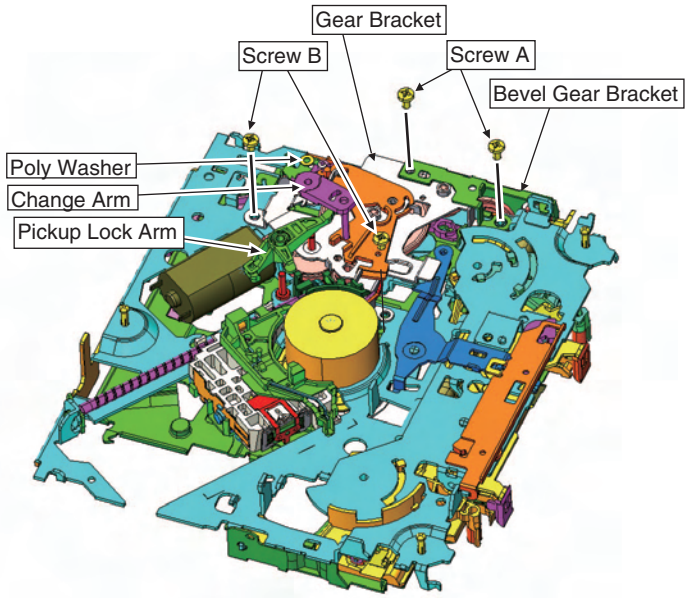
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.

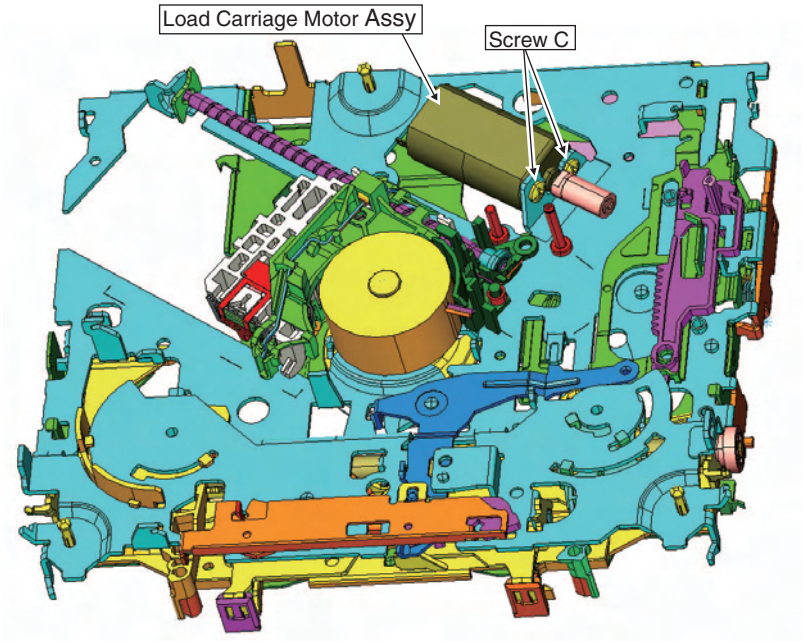


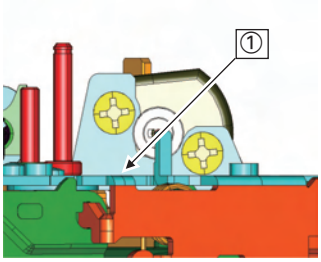
● How to remove the Load Carriage Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Release the leads (orange and purple) of Load Carriage Motor Assy from the CD Core Unit and remove the holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. Remove the two Screws (A) and the Bevel Gear Bracket (Note that the gears will come off).
5. Remove the two Screws (B) and the Gear Bracket (remove the CD Core Unit, if necessary), and remove all the gears.
6. Remove the two Screws (C) and the Load Carriage Motor Assy.

Caution: When assembling the Load Carriage Motor Assy, move it to the direction shown in the illustration (①).
When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



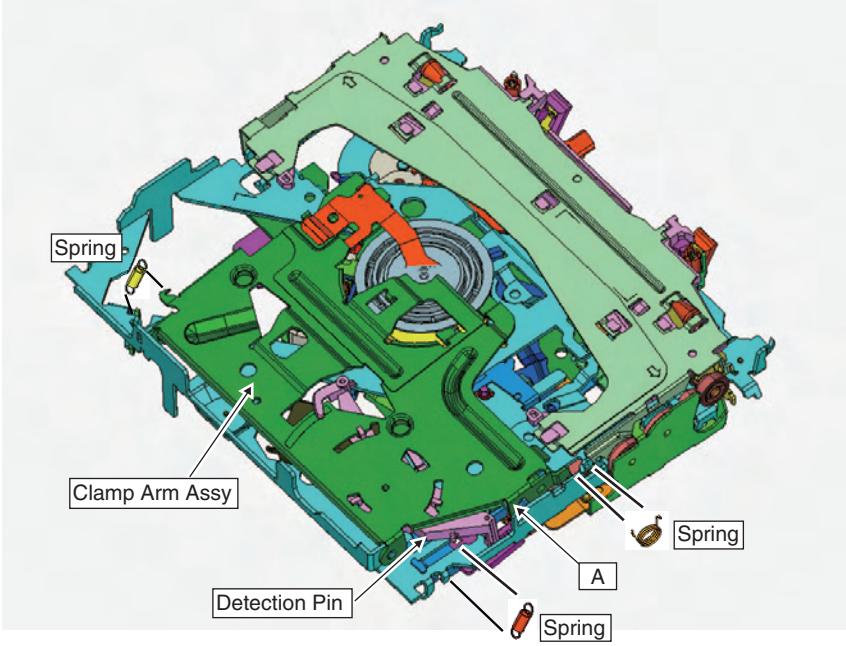


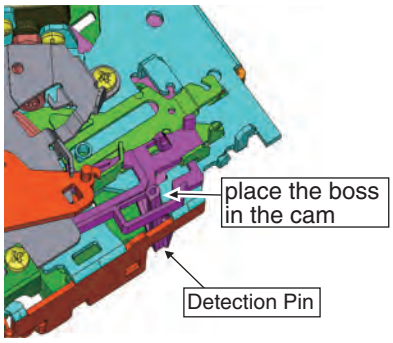


● How to remove the Clamp Arm Assy

1. Make the system in the carriage mechanism mode, and set the mechanism to the eject mode.
2. Remove the three Springs.
3. While pressing the position A, turn the Clamp Arm Assy upward, slide it to the left, and remove.

Caution: When assembling, place the boss of the Detection Pin in the cam unit of the Loading Rack.





● How to remove the Spindle Motor Assy

1.Make the system in the carriage mechanism mode, and have it clamped.
2.Remove the CD Core Unit and remove the leads from the Inner Holder.
3.Set the mechanism to the eject mode and remove the Clamp Arm Assy.
4.Set the mechanism to the clamped and move the Pickup to circumference.
5.Remove the two Screws, and remove the Spindle Motor Assy.